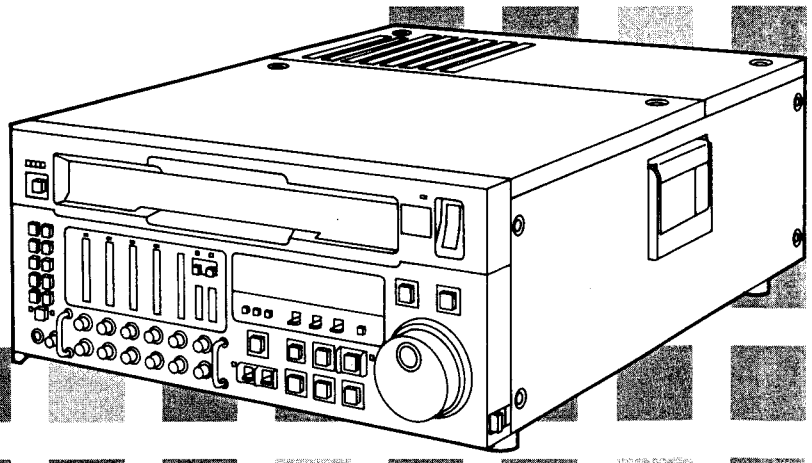
Panasonic

D-3 1/2" DIGITAL

Digital Video Cassette Recorder

Model AJ-D340P E

Operating Instructions



VQT5367

Precautions for Use (USA and Canada)

Since this VTR is designed for metal tapes only, make sure that only the designated tapes are used. An ordinary VHS tape cannot be used. Removal of the covers on electrical appliances for maintenance purposes may lead to electric shocks. Personnel should therefore adhere strictly to the normal safety precautions.
Some customer-preference switches are located on printed circuit boards within the unit. Be sure to turn off the power prior to opening the unit, before changing the position of any switch, and especially before removing or reinserting any circuit board.

FCC NOTE:
This device complies with Part 15 of the FCC Rules. To assure continued compliance follow the attached installation instructions and do not make any unauthorized modifications.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

WARNING: TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

CANADA ONLY/ CANADA SEULEMENT

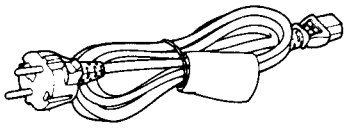
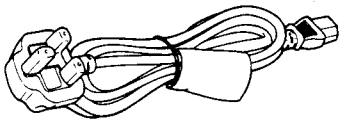
CAUTION
This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

ATTENTION
L'interférence radioélectrique générée par cet appareil numérique de type A ne dépasse pas les limites énoncées dans le Règlement sur les perturbations radioélectriques, section appareil numérique, du Ministère des Communications.

 is the safety information.

Caution for AC Mains Lead

FOR YOUR SAFETY, PLEASE READ THE FOLLOWING TEXT CAREFULLY.
This product is equipped with 2 types of AC mains cable. One is for continental Europe, etc. and the other one is only for U.K.
Appropriate mains cable must be used in each local area, since the other type of mains cable is not suitable.

FOR CONTINENTAL EUROPE, ETC. Not to be used in the U.K.	**FOR U.K. ONLY** If the plug supplied is not suitable for your socket outlet, it should be cut off and appropriate one fitted.
	

FOR U.K. ONLY

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 13 amp fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 13 amps and that it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⓐ or the BSI mark ⓚ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.
WARNING: THIS APPLIANCE MUST BE EARTHED.
IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

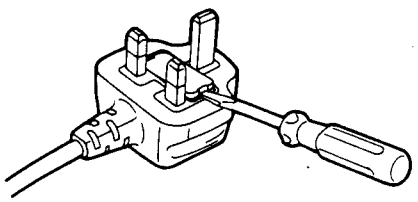
Green-and-Yellow:	Earth
Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

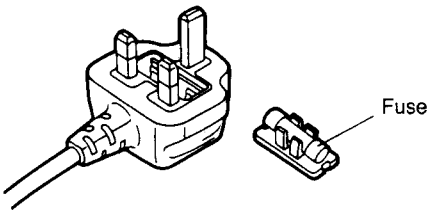
- The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol ⏚ or coloured GREEN or GREEN-AND-YELLOW.
- The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
- The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

How to replace the fuse

1. Open the fuse compartment with a screwdriver.



2. Replace the fuse.



Precautions for Use (Europe)

- Since this VTR is designed for use with metal tapes only, make sure that only the designated tapes are used. Ordinary VHS tapes cannot be used.
- Removal of the covers on electrical appliances for maintenance purposes may lead to electric shocks. The safety standard must be strictly adhered to and safety measures employed.
- Some customer preference switches are located on printed circuit boards within the unit. Be sure to turn off the power prior to opening the unit, before changing the position of any switch, and especially before removing or reinserting any circuit board.

■ **THIS APPARATUS MUST BE EARTHED.**

To ensure safe operation the three-pin lead supplied must be connected only into a standard three-pin power point which is effectively earthed through the normal household wiring.

Extension cords used with the equipment must be three-pin and be correctly wired to provide connection to earth. Wrongly wired extension cords are a major cause of fatalities.

The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe. For your safety, if in any doubt about the effective earthing of the power point, consult a qualified electrician.

■ **DO NOT REMOVE PANEL COVER BY UNSCREWING.**

To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

WARNING: TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

Remark:

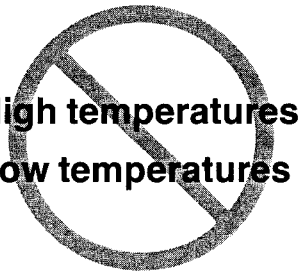
- This apparatus was produced to BS 800.
- Dieses Modell entspricht der EG-Vorschrift (für Funkstörungsschutz) 87/308/EWG.
- La Société PANASONIC-FRANCE, importateur du matériel MATSUSHITA-JAPON déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E modifiée par la directive 87/308/C.E.E.
- Dit model is onderworpen aan de EEG-richtlijn (ter voorkoming van radio-interferentie) 87/308/EEG.
- Denne model opfylder EF direktiv 87/308/EF (for forebyggelse af radiointerferens).
- La Società PANASONIC ITALIA S.p.A., importatrice di questo prodotto, dichiara che questo apparecchio è conforme alle disposizioni della direttiva C.E.E./87/308 (D.M. 13.4. 1989).
- Este modelo cumple con la norma EC (para interferencias de radio 87/308/ECC).

WARNING:

Unauthorized recording of copyrighted television programmes, films, video tapes and other materials may infringe on the rights of copyright owners and be contrary to copyright laws.

Precautions

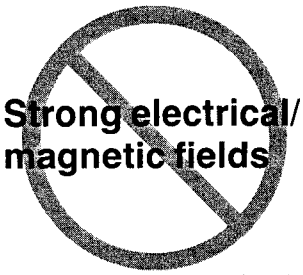
Do not use the VTR in a location subjected to a great deal of vibration.



Use the VTR at temperatures ranging from 41°F to 104°F (5°C to 40°C).
Do not use it outside this range.

Do not use the VTR in the rain, at high humidity levels and in extremely dusty locations.

Do not drop the VTR or subject it to strong impact.

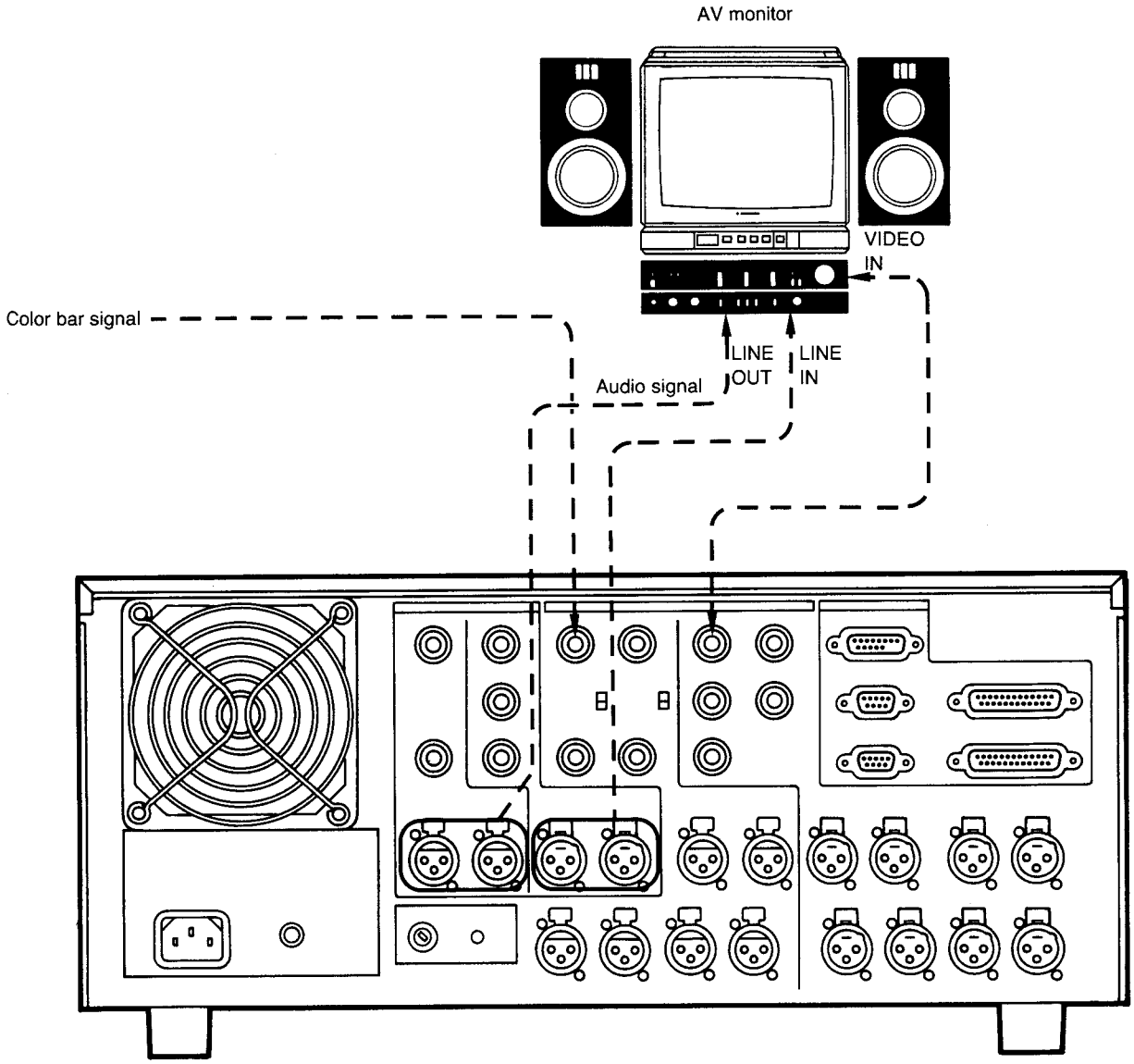


Using the VTR in extremely strong electrical or magnetic fields may result in a deterioration in the picture and sound quality.

Do not use the VTR where it will be exposed to direct sunlight for long periods of time.

Contents

Connecting the VTR for the first time



Recording color bar signals

1 Loading the tape

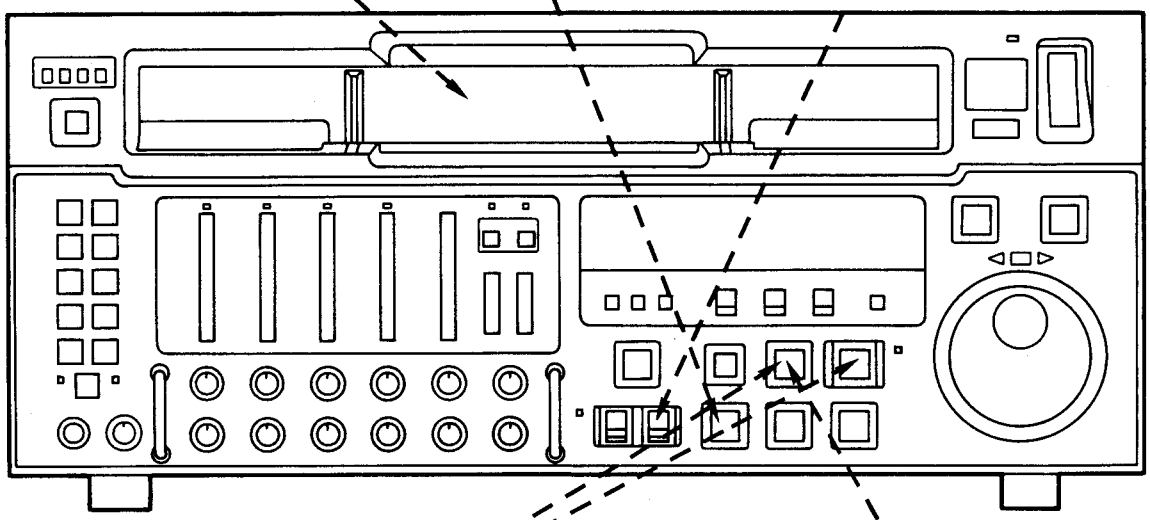
Load a tape.

2 Rewinding the tape

Press REW ◄◄ .

3 Check the input signals

MODE TAPE / EE ⇩ Set the mode switch to EE.



4 Recording

Press PLAY ► while keeping REC ● depressed.

5 Stop and rewind

First press STOP ■ and then REW ◄◄ .

6 Playing back the tape

Press PLAY ► .

Operating precautions

Power supply

- Use a supply voltage that conforms to the rating.
- Be sure to take hold of the power plug (and not the cable) when connecting and disconnecting the recorder.
- Do not run the power cable near a heating appliance.
- Do not place heavy objects on top of the power cable.
- Do not tamper with the power cable in any way.

When trouble occurs:

- When trouble occurs, immediately contact your authorized service personnel.

Auto OFF function

- When trouble occurs in the VTR and continued operation is not possible without remedial action, the AUTO OFF and SYSTEM lamps on the VTR's front panel light, and the VTR stops operating.
  If the power is turned off or on in this state, the tape may be damaged.
- Check the transport status of the tape. If it has become disengaged from the transport system, remove the tape either manually or using the optional emergency ejector unit. Normal operation can sometimes be restored when the power is turned off and on again.
- Repairs are necessary if the AUTO OFF status is not released even when the power is turned off and back on again. Set the power switch to the OFF position immediately, disconnect the power plug from the power outlet, and contact your authorized service personnel.
- If the AUTO OFF function has ever been activated, contact your authorized service personnel regardless of whether normal operation was restored.

Tips for safe handling

- Do not insert or remove circuit boards or handle the leads with the power still ON.
- Bear in mind that you might be burned if you touch heavy-load parts or overheated areas.
- Bear in mind that some areas inside the VTR have a high voltage.
- There are times when the danger of electric shocks is present even after the power has been switched off. In particular, take care with the capacitors.
- Do not insert or poke foreign objects through the cassette slot or any other openings in the main unit.

Transporting the VTR

- Each circuit board block of this VTR is provided with a clamping device to prevent the circuit board from popping out. Be sure to screw them in place especially when transporting the VTR.

Features

Proud successor to the D-3 format

- This is a broadcasting VTR based on the D-3 format standard which, having been used by broadcasting stations in countries throughout the world, has a proven track record.
- The highly precise mechanisms, control technology, high-output heads and powerful error correction function enable the recording and playback of high-density composite digital signals on half-inch tapes.
- No matter how many times tapes are copied, there is no deterioration in the picture and sound quality.

Long-term recording

- The half-inch metal cassette tapes specially designed for use with digital VTRs make long-duration recording and playback of up to 245 minutes possible.
- Three cassette sizes (S, M and L) can be used without an adaptor.

Compact size, light weight and low power consumption

- 4RU compact design
- Compact size with external dimensions of 17½" (W)×8" (H)×21 1/16" (D) (444×202×550 mm)
- Weight: only 68.2 lbs (31 kg)
- Low power consumption of 340 W

Digital serial interface

- A digital serial interface conforming to the SMPTE 259M standard is provided as a standard accessory.

Operation panel offering direct access

- The video and audio recording/playback levels can be adjusted directly.
- The waveform output or monitor output can be selected directly.

4 audio channels, digital recording/playback

- High-sound-quality audio signals with a 48 kHz sampling frequency and 95 dB dynamic range can be digitally recorded and played back separately for each of 4 channels.
- In addition to the digital sound, one more channel (cue track) is provided for analog sound.

High-speed, high-picture-quality search function at 100 times normal tape speed

- Shuttle searches for color pictures can be conducted at up to 100 times normal tape speed in either the forward or reverse directions.

Specifications

Power requirements

Power supply:	AC 120 V ±10%, 50–60 Hz (NTSC/AJ-D340P) AC 220 to 240 V ±10%, 50–60 Hz (PAL/AJ-D340E)
Power consumption:	340 W

 is the safety information.

General

Ambient operating temperature:	41°F to 104°F (5°C to 40°C) (without condensation)
Ambient operating humidity:	10% to 90%
Weight:	68.2 lbs (31 kg)
External dimensions:	17 3/16" (W)×6 15/16" (H)×21 1/16" (D) [436×176×550 mm]
Recording format:	D-3 format (½" digital)
Recording tracks:	Digital video, digital audio (4 channels); 6 tracks/field (NTSC) 8 tracks/field (PAL) Cue audio; 1 track Time code; 1 track CTL; 1 track
Tape speed:	83.88 mm/sec.
Tapes used:	D-3 S/M/L cassettes (metal tape)
Recording duration:	NTSC; L=245 min., M=125 min., S=64 min. (using 11 µm thick tape) L=185 min., M=64 min., S=50 min. (using 14 µm thick tape) PAL; L=245 min., M=125 min., S=64 min. (using 11 µm thick tape) L=185 min., M=64 min., S=50 min. (using 14 µm thick tape)
Servo lock time:	Less than 0.5 sec. (color framing/standby ON) (NTSC) Less than 0.6 sec. (color framing/standby ON) (PAL)

Video specifications

Sampling frequency:	14.3 MHz (4FSC)
Quantizing:	8 bits, IQ axis quantizing
Channel coding:	New 8-14 system
Video band:	0 Hz to 5.5 MHz ±0.5 dB, 6.2 MHz +0/−3 dB (NTSC) 0 Hz to 6.0 MHz ±0.5 dB, 7.5 MHz +0/−3 dB (PAL)
S/N ratio:	54 dB (theoretical value)
Differential gain:	Less than 2%
Differential phase:	Less than 1°
Moire:	0
Y/C delay:	Less than 15 ns
Tilt:	Less than 1%, (V, H)
LF linearity:	Less than 2%
K factor:	Less than 1%
Output SCH phase:	Based on RS-170A standard (NTSC) Complies with CCIR report 624-3 (PAL)
Input level adjustment:	±3 dB (analog input only)
Output adjustments:	Video gain; −∞ to 3 dB Chroma gain; −∞ to 3 dB Hue; ±15° (NTSC) Chroma phase; ±15° (PAL) Setup; ±15 IRE (NTSC) Black level; ±100 mV (PAL) Video phase; ±2.2 µs (280 ns/step) (NTSC) ±1.8 µs (224 ns/step) (PAL) Sync phase; ±2.2 µs (280 ns/step) (NTSC) ±1.8 µs (224 ns/step) (PAL) SC phase; More than 360°

Digital audio specifications

Sampling frequency:	48 kHz (synchronized with video)
Quantizing:	20 bits
Frequency response:	20 Hz to 20 kHz ±0.5 dB
Dynamic range:	More than 95 dB (1 kHz emphasis OFF, "A" weighted)
Distortion:	Less than 0.03% (1 kHz emphasis OFF, reference level)
Crosstalk:	Less than −80 dB (1 kHz, between 2 channels)
Wow & flutter:	Below measurable limits
Headroom:	20 dB
Input/output level:	+4/0/−20 dBm selectable (line input/output) (NTSC) +4/0/−20 dBu selectable (line input/output) (PAL)
Emphasis:	T1=50 µs/T2=15 µs (ON/OFF selectable)
Input/Output level adjustment:	−∞ to +12 dB

Cue audio specifications

Frequency response:	100 Hz to 12 kHz ±3 dB
S/N ratio:	More than 44 dB (3% distortion)
Distortion:	Less than 2% (1 kHz reference signal)
Wow & flutter:	Less than 0.2% (NAB unweighted)
Input/output level:	+4/0/−20/−60 (input only) dBm selectable (line input/output) (NTSC) +4/0/−20/−60 (input only) dBu selectable (line input/output) (PAL)
Input/Output level adjustment:	−∞ to +12 dB

Video input/output signals

Analog input:	BNC×2, loop through Composite 1.0±0.3 Vp-p
Digital input:	BNC×2, active through (also serves as audio digital input) Serial, complies with SMPTE 259M standard
Reference input:	BNC×2, loop through Composite, black burst (sync & burst 0.3 Vp-p)
Analog output:	BNC×3 Video 1 (VBS/VB/VS/V selectable) Video 2 (VBS) Video 3 (superimpose ON/OFF)
Digital output:	BNC×3 (also serves as audio digital output) Serial, complies with SMPTE 259M standard

Audio input/output signals

Analog input:	XLR 3P×4 CH1, 2, 3, 4; Max. +24 dBm, 600Ω/high impedance (NTSC) CH1, 2, 3, 4; Max. +24 dBu, 600Ω/high impedance (PAL)
Digital input:	XLR 3P×2 CH1/2, 3/4; AES/EBU format BNC×2, active through (also serves as video digital input) Serial, complies with SMPTE 259M standard
Cue input:	XLR 3P×1 Max. +14 dBm, 600Ω/high impedance (NTSC) Max. +14 dBu, 600Ω/high impedance (PAL)
Analog output:	XLR 3P×4 CH1, 2, 3, 4; Max. +24 dBm, low impedance (NTSC) CH1, 2, 3, 4; Max. +24 dBu, low impedance (PAL)
Digital output:	XLR 3P×2 CH1/2, 3/4; AES/EBU format BNC×3, (also serves as video digital output) Serial, complies with SMPTE 259M standard
Cue output:	XLR 3P×1 Max. +14 dBm, low impedance (NTSC) Max. +14 dBu, low impedance (PAL)
Monitor output:	XLR 3P×2 Max. +24 dBm, low impedance (NTSC) for left/right Max. +24 dBu, low impedance (PAL) for left/right
Headphones:	Variable level (mini-plug)

Other input/output signals

Time code input:	XLR 3P×1 2.4±1.4 Vp-p, 10 kΩ, balanced
Time code output:	XLR 3P×1 2.4, low impedance, balanced
Waveform output:	BNC×1 VIDEO (IN/OUT)/CTL/TIME CODE/ENV (CH0/CH1)/EYE (CH0/CH1) (selectable)
Subcarrier output:	BNC×1

Remote signals

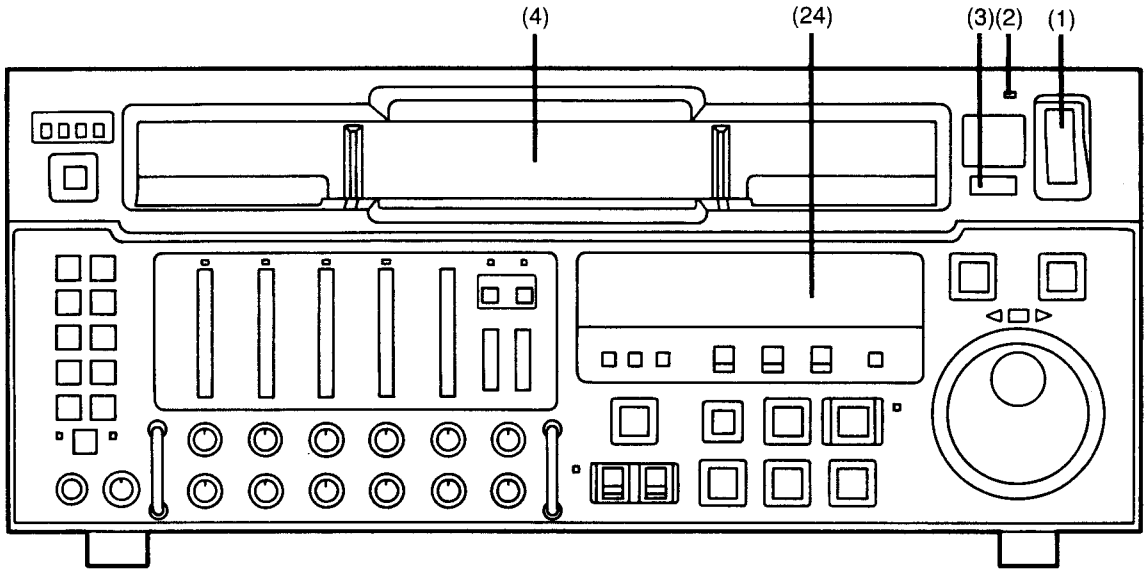
RS-422A input:	D-Sub 9P×1, RS-422A interface
RS-422A output:	D-Sub 9P×1, RS-422A interface
RS-232C:	D-Sub 25P ×1, RS-232C interface
Video/Audio control:	D-Sub 15P×1, video/audio remote control
AUX:	D-Sub 25P×1, for system expansion (also serves for parallel remote)

Accessories

1. Power cable
2. Extension board

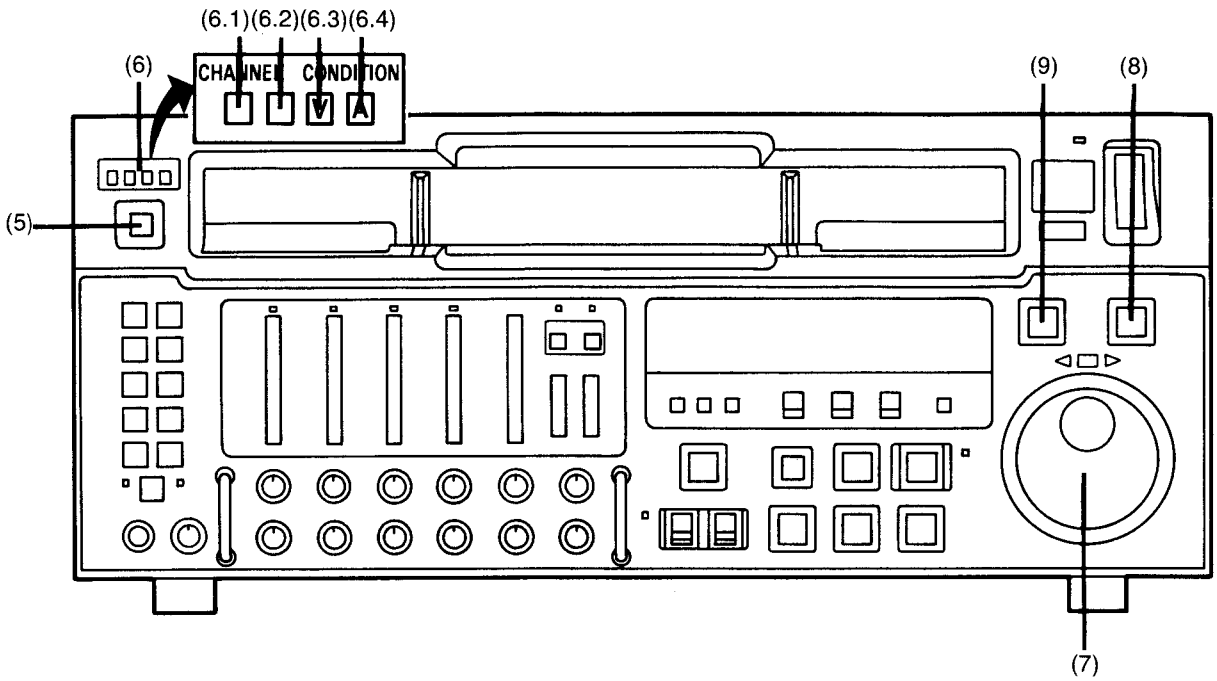
Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Controls and their functions

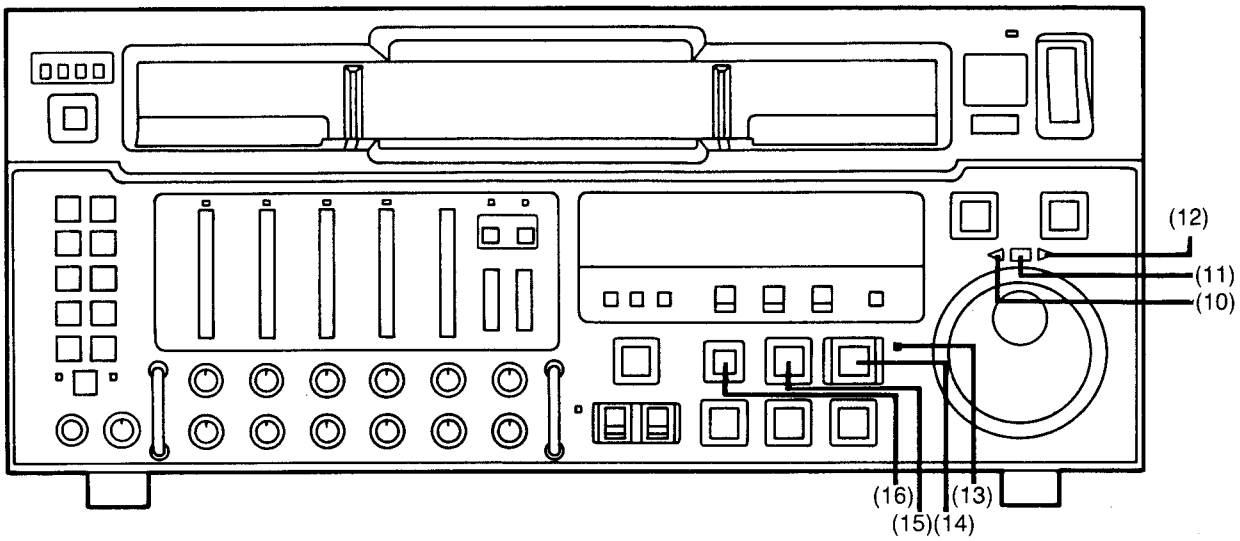


Power supply section	
(1) POWER switch	●When the ON side is pressed, the power is turned on; when the OFF side is pressed, the power is turned off.
(2) POWER lamp	●This lights when the power is turned on.
(3) AUTO OFF lamp	●This lights when trouble has occurred in the VTR and operation cannot be continued without remedial action. ●A message number indicating the nature of the trouble appears on the display (24). See pages 67 to 72.

Cassette loading section	
(4) Cassette holder	●This is the slot where the cassette tape is loaded. S, M or L cassettes can be used.

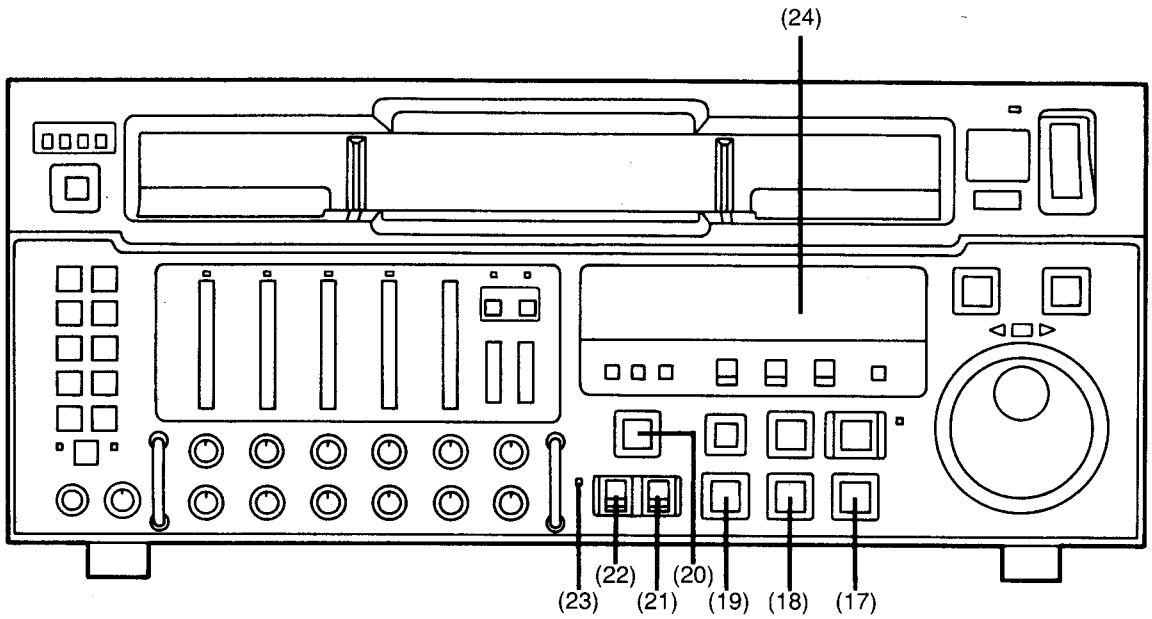


Basic control section	
(5) EJECT button	•When this button pressed, the lamp lights and the cassette tape is ejected.
(6) Error display (channel/condition)	•These lamps light in response to the number of errors. (6.1) Lights during normal operation (when the error value is minimal). (6.2) Lights when the inner errors have increased. (6.3) Lights when the video outer errors have increased. (6.4) Lights when the audio outer errors have increased.
(7) SEARCH dial	•Rotary dial for varying the tape transport. •When this is turned in the JOG or SHTL mode, the tape transport direction and speed can be varied. •It can be used even with on-screen menu selection. (See page 63 for details.)
(8) SHTL button	•The SHTL lamp lights when this button is pressed, and the shuttle mode is established. If the search dial is now turned clockwise or counterclockwise and stopped at a particular position, the tape will be played back at the speed corresponding to that position. •A still picture appears at the center position. •The maximum tape speed is 100× the normal tape speed in either the forward or reverse direction. It can be changed to another value on-screen.
(9) JOG button	•The JOG lamp lights when this button is pressed, and the jog mode is established. If the search dial is now turned clockwise or counterclockwise, the tape will be played back at the speed (−3× to +3×) corresponding to the speed at which the dial is turned. •A still picture appears at the position where the dial turning is stopped.

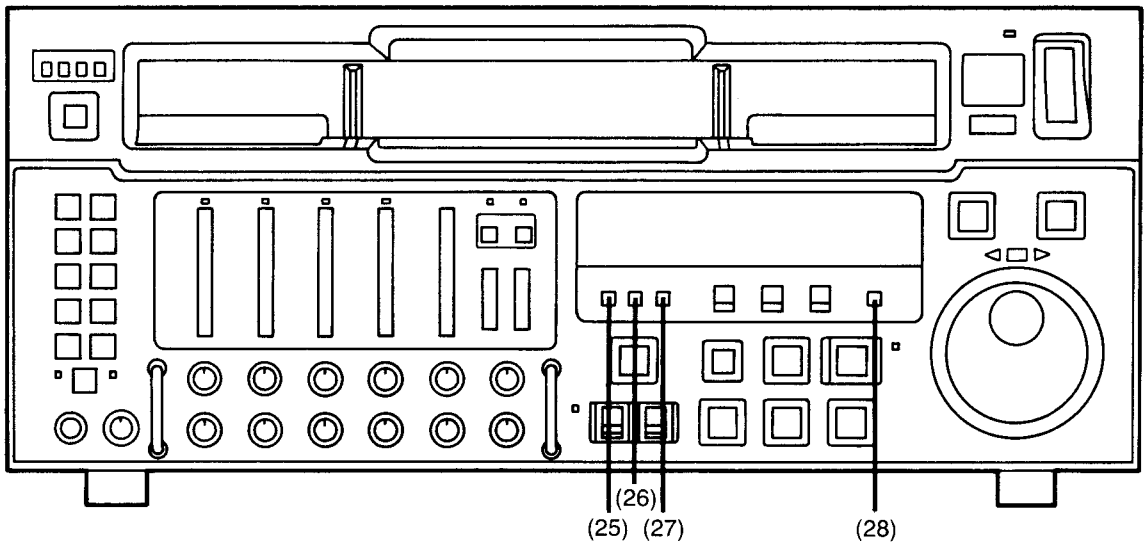


Basic control section

(10) REV lamp	•This lights when the tape is traveling in the reverse direction in the JOG or SHTL mode.
(11) STILL lamp	•This lights when the tape travel is set to the still-picture status in the JOG or SHTL mode.
(12) FWD lamp	•This lights when the tape is traveling in the forward direction in the JOG or SHTL mode.
(13) REC INHIBIT lamp	•This lamp indicates the recording inhibit mode. •It lights when the REC INHIBIT switch at the bottom front is set to ON or when the cassette's recording prevention pin is set to the recording prevention position. Recording is prohibited while it is ON.
(14) REC button	•When the PLAY button is pressed while the REC button is being pressed, both the REC and PLAY lamps light and the recording mode is established. •The recording mode is not established if the REC INHIBIT lamp is ON.
(15) PLAY button	•When this button is pressed, its lamp lights and the normal playback mode (normal tape speed in forward direction) is established. •To release the play mode, press the STOP, FF, REW, JOG, SHTL or EJECT button. •Auto tracking is conducted automatically the first time that the tape is played after it has been loaded. For further details, see page 49.
(16) READY (STAND BY) button	•READY mode ON/OFF button; it functions only in the STOP mode. Its lamp lights in the READY ON mode. When the READY button is now pressed, the lamp turns off and the READY OFF mode is established. •When the tape has been stopped in the READY ON mode beyond a specified period of time (see page 56 for the setting), the lamp is automatically turned off and the READY OFF mode is established.

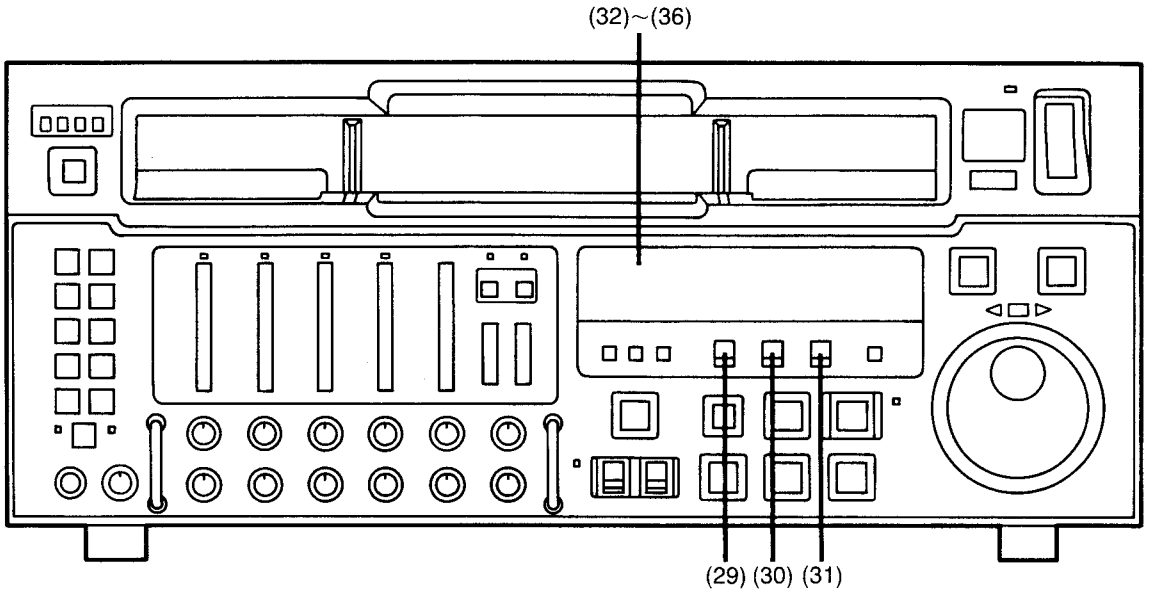


Basic control section	
(17) FF button	•When this button is pressed, its lamp lights, and the tape is made to travel in the forward direction at 100× normal tape speed. •The tape speed can be changed on-screen.
(18) STOP button	•When this button is pressed, its lamp lights, and all the VTR's modes are shut down. •When it is pressed in the READY OFF mode, the READY ON mode is established.
(19) REW button	•When this button is pressed, its lamp lights, and the tape is made to travel in the reverse direction at 100x normal tape speed. •The tape speed can be changed on-screen.
(20) PREROLL button	•When this button is pressed, its lamp lights, and the tape comes to a halt at the preroll point. •The preroll time can be changed on-screen.
(21) MODE switch	•This selects the video and audio output signal mode. •The output status varies depending on the combination of the TAPE/EE selection and operating mode. See page 42.
(22) CONTROL switch	•This switches between operation from the VTR's front panel (LOCAL) and operation from the rear panel's remote connector (REMOTE). •At the REMOTE position, the VTR can be operated by remote control from the rear panel's remote connector. •At the LOCAL position, the VTR can be operated using the front panel controls.
(23) REMOTE lamp	•This lights when the CONTROL switch has been set to the REMOTE position.
(24) DISPLAY	•This display uses an 8-digit fluorescent display tube. •It displays the time code, control signal count and user bit.

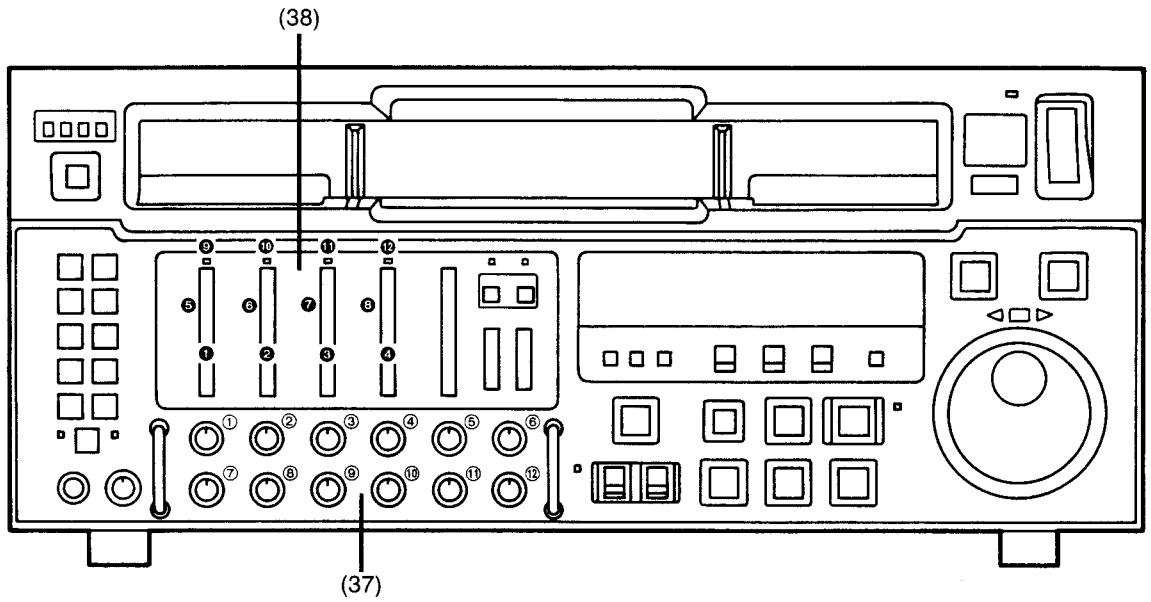


Basic control section

(25) SHIFT button	•This is used to set the time code generator value. •When it is pressed, the leftmost digit display flashes and each time the button is pressed, the flashing display moves to the next digit on the right. When the button is pressed at the right-most digit, the flashing display returns to the left-most digit.
(26) ADJ button	•This is used to change the number where the display is flashing. •When pressed once, the number is advanced by 1; when kept depressed, the numbers are advanced rapidly. •When the user bit is displayed, the setting is advanced through numbers 0 to 9, A, B, C, D, E and F, after which it is returned to 0.
(27) START button	•This sets the time code of the display to the generator. •When the button is pressed at times other than when the time code or user bit is set, the display will change depending on the position of the CTL/TC/UB switch. At the CTL position: No change At the TC position: TC generator value At the UB position: UB generator value
(28) RESET button	•When this is pressed while the CTL/TC/UB switch is at CTL, the display is cleared to zero. •When this is pressed simultaneously with the SHIFT button while the CTL/TC/UB switch is at TC or UB, the display is cleared to zero.

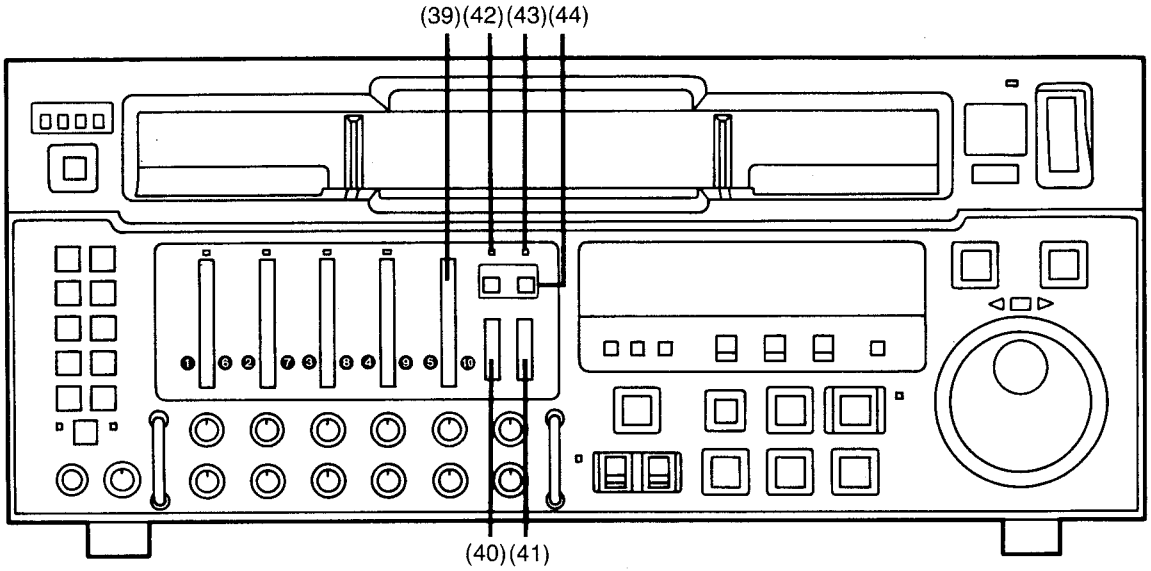


Basic control section	
(29) CTL/TC/UB switch	●This selects which setting is to appear on the display. ●At the CTL position, the control signal count appears. ●At the TC position, the time code signal value appears. ●At the UB position, the user bit value appears.
(30) INPUT AUDIO switch	●This selects the input audio signals. ●At the DIGITAL position, digital signals are selected as the input audio signals for all channels. The signals set on-screen are selected as the digital signals. ●At the ANALOG position, analog signals are selected as the input audio signals for all channels. ●At the USER SET position, the digital and analog signals can be selected separately for each channel on-screen as the input audio signals. The signals selected on-screen are selected as the digital signals in this case. See page 59.
(31) INPUT VIDEO switch	●This selects the input video signals. ●At the DIGITAL position, digital signals are selected as the input video signals. ●At the ANALOG position, analog signals are selected as the input video signals.
(32) SYSTEM lamp	●This lights when trouble occurs in the VTR and its operation cannot be guaranteed.
(33) HUMID lamp	●This lights when the formation of condensation is sensed.
(34) RF lamp	●This lights when the RF envelope falls below the prescribed value.
(35) SERVO lamp	●This lights with servo lock.
(36) CF lamp	●This lights with color frame servo lock.



Basic operations

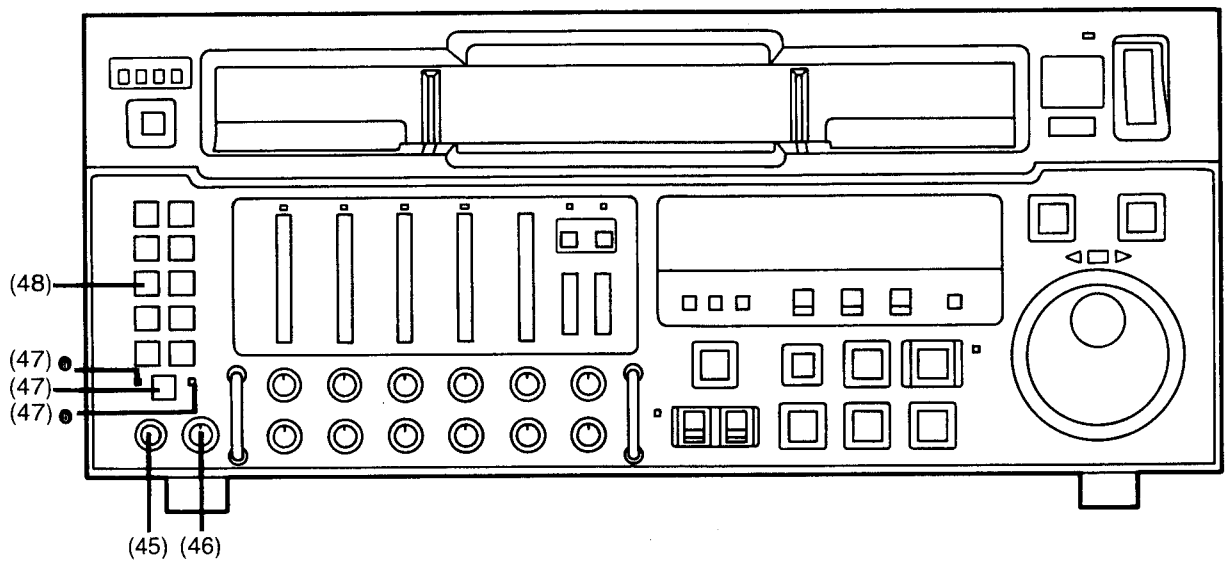
(37) Level adjustment variable resistors (VRs)	•VRs ① to ⑥ on the top row are for adjusting the recording level. •VRs ⑦ to ⑫ on the bottom row are for adjusting the playback level. •These VRs can either be pushed in or pulled out. Level adjustment is possible only when they are pulled out. •When pushed in, the level is returned to its initial setting. •The VRs and the levels they can adjust are shown below: ① Adjusts the digital audio CH1 recording level. ② Adjusts the digital audio CH2 recording level. ③ Adjusts the digital audio CH3 recording level. ④ Adjusts the digital audio CH4 recording level. ⑤ Adjusts the cue audio recording level. ⑥ Adjusts the video signal recording level. ⑦ Adjusts the digital audio CH1 playback level. ⑧ Adjusts the digital audio CH2 playback level. ⑨ Adjusts the digital audio CH3 playback level. ⑩ Adjusts the digital audio CH4 playback level. ⑪ Adjusts the cue audio playback level. ⑫ Master VR •All the digital audio playback levels can be adjusted. (Initial setting) •The digital audio levels controlled by the master VR can be adjusted on-screen.
(38) Digital audio signal level meters	•Level meters ❶ to ❹ indicate the recording or playback level of the digital audio signals. •Meters ❶ to ❹ correspond to the digital audio signals of channels 1 to 4, respectively. •Meters ❺ to ❽ indicate the signal levels. •The meters indicate the value corresponding to the level (FINE or FULL) of the mode which has been selected using the FINE/FULL switch at the bottom of the front panel. •In the FINE mode, −15 dB to −24 dB levels are indicated. •In the FULL mode, 0 dB to −∞ levels are indicated. •OVER lamps (❾ to ⓬) light when the level of an input or output signal has exceeded the rating.



Basic operations

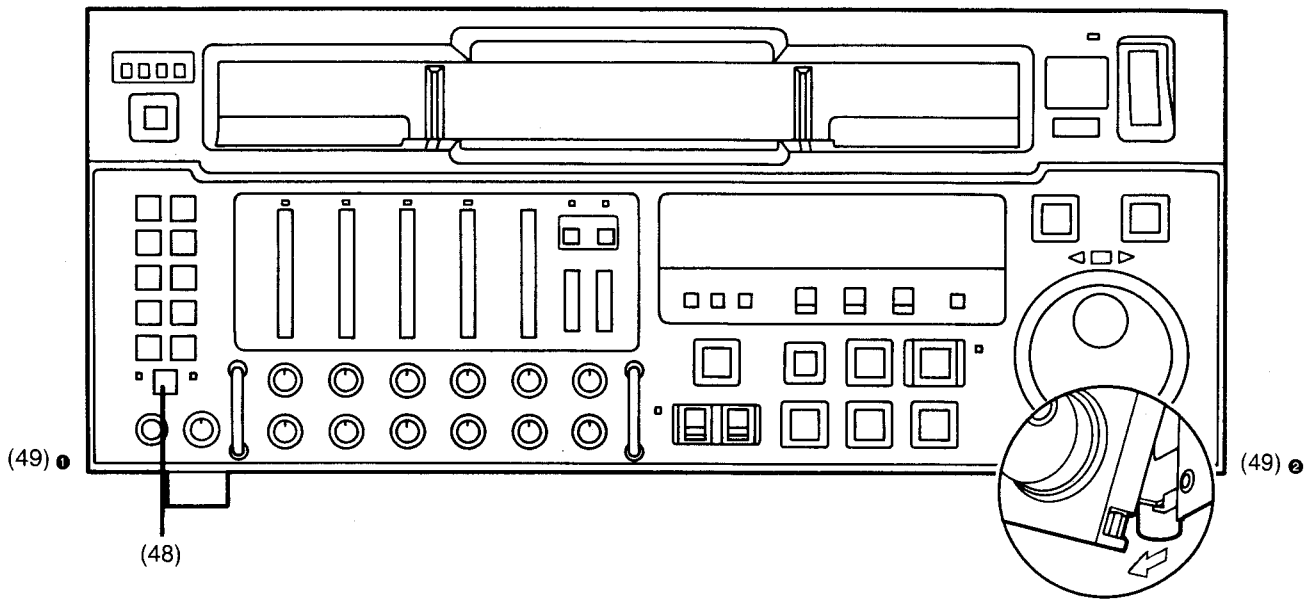
(39) CUE audio signal level meter	• This meter indicates the recording or playback level of the cue audio signals.
	• The meter indicates the value corresponding to the level (FINE or FULL) of the mode which has been selected using the FINE/FULL switch at the bottom of the front panel.
	  • In the FINE mode, a −15 dB to −24 dB level is indicated.
	  • In the FULL mode, a 0 dB to −∞ level is indicated.

(40) Video signal level meter	• This indicates the input level of the video signals during recording and the playback level of the playback RF signals during playback. • Recording level: A value within ±3 dB is indicated. • Playback level: No correspondence with ±3 dB display.
(41) SCH meter	• This indicates the phase of the SCH. • It indicates a phase shift of less than ±80°. • Input SCH or Ref SCH can be selected on the on-screen menu.
(42) FINE lamp	• This lights when the FINE/FULL switch at the bottom of the front panel has been set to the FINE position. • In this mode, the level meters indicate the levels in the FINE mode.
(43) FULL lamp	• This lights when the FINE/FULL switch at the bottom of the front panel has been set to the FULL position. • The level meters indicate the levels in the FULL mode.
(44) AUDIO MONITOR selector buttons	• These switch between the audio monitor and headphones jack output channel. • They are used to select the L/R signal of the channel among the signals of 5 channels (4 digital audio signal channels +1 cue audio signal channel) which are to be output. • Only the L or R signal can be selected from each channel. • Each time the L (or R) button is pressed, the output L (or R) signal changes: the sequence of change is CH1, CH2, CH3, CH4 and cue. • The channel now selected can be monitored by observing the ❶ to ❺ L and ❻ to ❿ R display lamps. • The L and R lamps corresponding to the channels now selected light. • Initial settings: CH1 for L and CH2 for R.



Basic operations

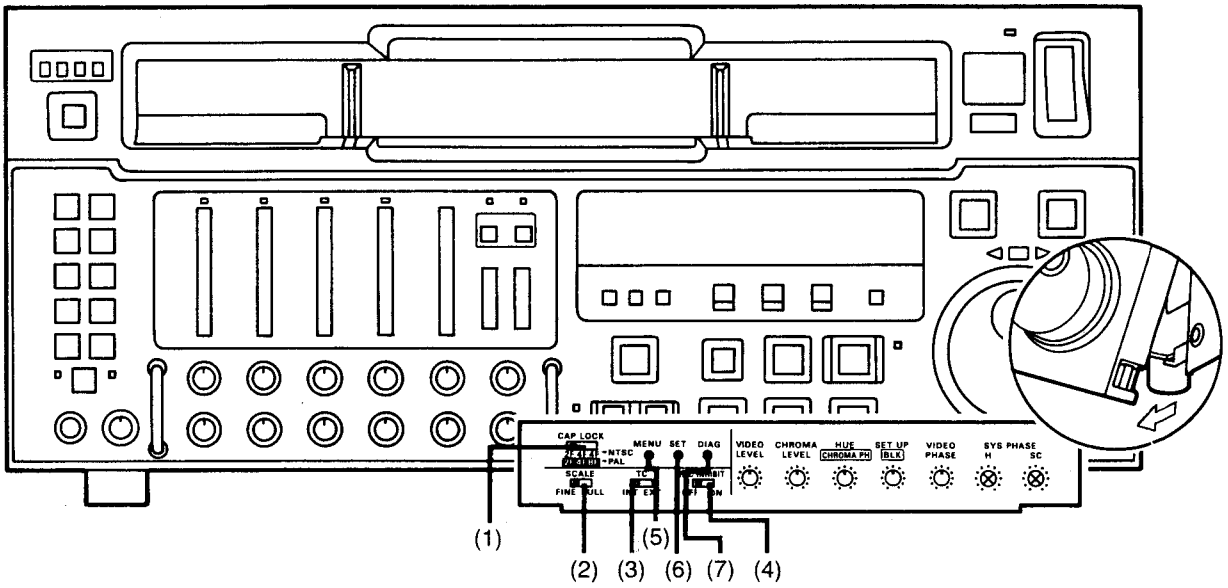
(45) Headphones jack	•The stereo headphones are connected to this mini-jack.
(46) Headphones VR	•This volume control is used to adjust the headphones output level and monitoring output level. •The headphones output level and monitoring output level are interlinked.
(47) WFM/CUE selector button	•This selects the waveform (WFM) or the cue mode. •Each time it is pressed, the WFM or CUE mode is selected alternately. •When the WFM mode has been selected, the WFM lamp (47) ⓐ lights. •When the cue mode has been selected, the cue lamp (47) ⓑ lights or flashes.
(48) WFM selector button/CUE selector button *(Continued on the next page)*	•These buttons select the type of waveform to be output and conduct cue point entry/check/clear/search operations. •When a button is selected, its lamp lights or flashes. ① In WFM mode •The signal which is output to the WFM output connector in the connector section can be selected from among 8 types of output signals (IN, OUT, ENV1, ENV2, EYE1, EYE2, CTL or TC). IN: The video input signal is output. OUT: The video output signal is output. ENV1: The detection signal of the RF signal played back by video head CH0 is output. ENV2: The detection signal of the RF signal played back by video head CH1 is output. EYE1: The RF signal played back by video head CH0 is output. EYE2: The RF signal played back by video head CH1 is output. CTL: The control signal is output. TC: The time code signal is output.



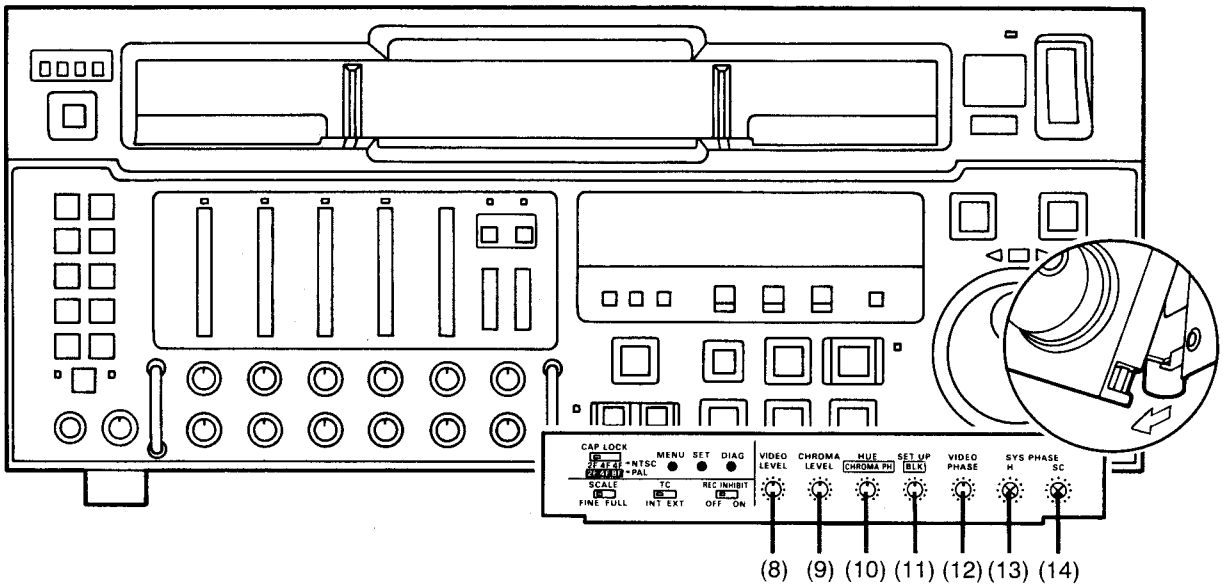
Basic operations

(48) WFM selector button/CUE selector button	② In cue mode The cue point can be entered or the tape cued up using the CUE SET or CUE SEARCH button. See pages 37 to 41.
(49) Panel open/close buttons	• The front panel can be opened and closed by pulling out buttons ❶ and ❷ at the sides of the front panel.

Switches at bottom of front panel

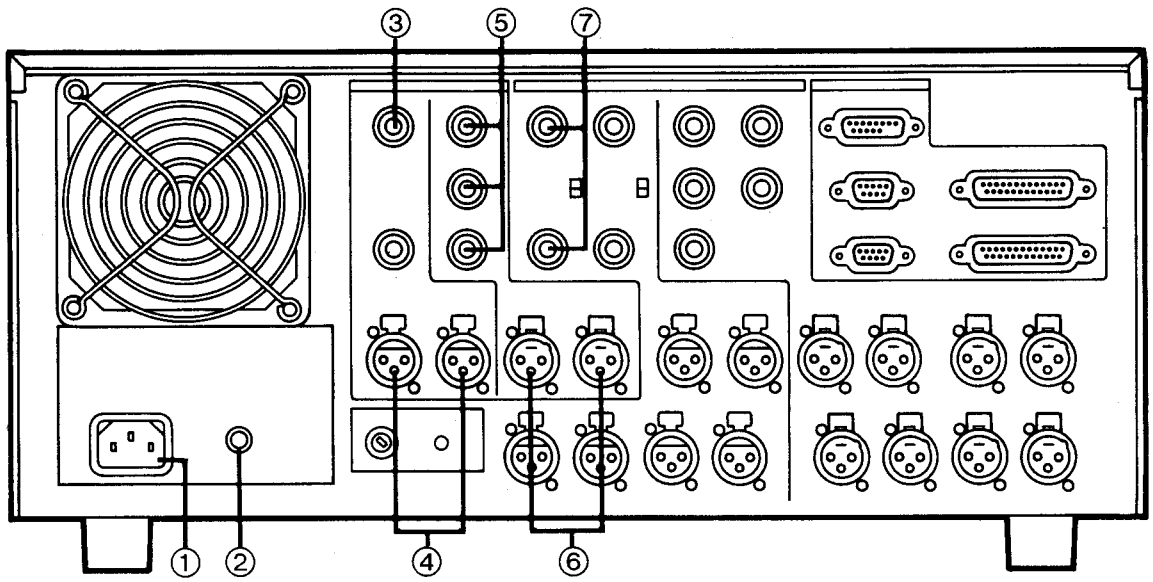


(1) CAP LOCK switch	●This 3-position selector switch is for setting the lock mode of the capstan. ●The 2F or 4F mode can be set for the NTSC system. The 4F mode setting is on the far right. ●The 2F, 4F or 8F mode can be set for the PAL system. ●AUTO or FORCE are selected on-screen.
(2) FINE/FULL switch	●This selects the display sensitivity of the level meters indicating the PCM/CUE audio signals. ●When FINE has been selected, the level meters indicate values from −15 to −24 dB. ●When FULL has been selected, the level meters indicate values from 0 to −∞ dB.
(3) TC SOURCE switch	●This selects either the time code of the internal generator or the time code supplied from an external source to be used as the time code to be recorded. ●When INT has been selected, the time code generated by the internal generator is used. ●When EXT has been selected, the time code supplied by an external source is used.
(4) REC INHIBIT switch	●When this switch is set to OFF and the accidental erasure prevention tab on the cassette has been set to the erasure enable position, signals can be recorded onto the cassette tape. ●When it is set to ON, the recording of signals onto the tape is prohibited.
(5) MENU switch	●If this switch is pressed, the on-screen menu appears on the monitor screen. ●If it is pressed again, the on-screen menu is cleared from the monitor screen.
(6) SET switch	●This switch enables using of the status set on-screen after its setting. ●If a menu is selected on-screen and this switch is pressed, the selected menu will be set.
(7) DIAG switch	●If this switch is pressed when the VTR's SYSTEM lamp or AUTO OFF lamp is lighted, the nature of the error causing the lamp to light appears on the screen. ●An error number appears on the front display.

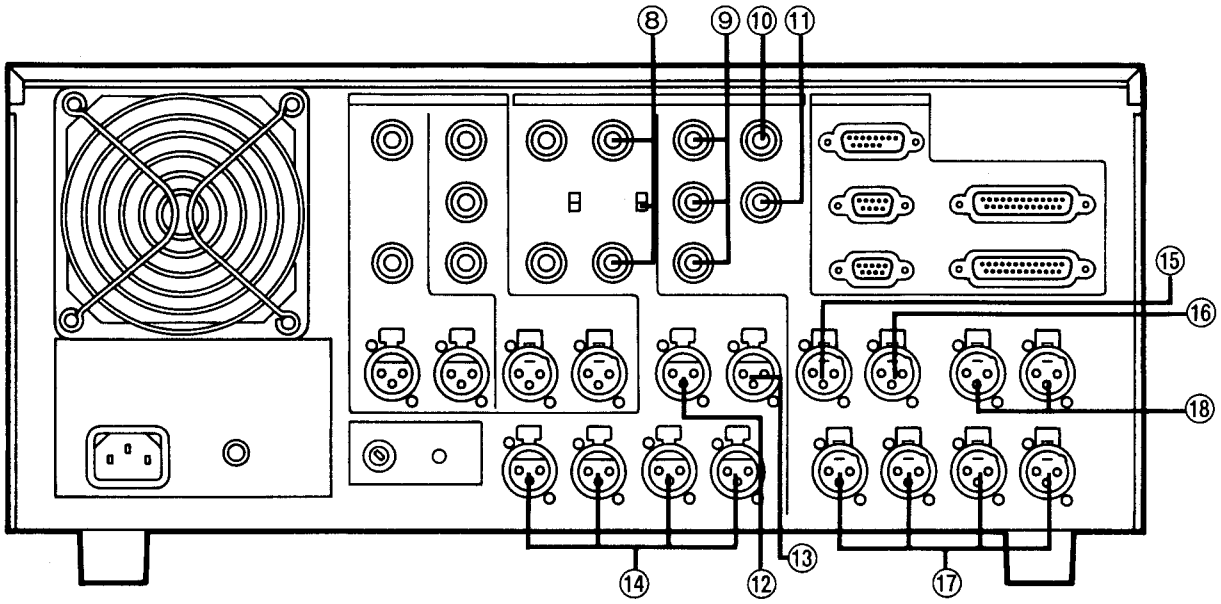


(8) VIDEO VR	•This control adjusts the video levels except sync and burst.
(9) CHROMA VR	•This control adjusts the chroma level. The level is set using standard color bar signals.
(10) HUE VR (NTSC)/ CHROMA PHASE VR (PAL)	•This controls sets the hue (NTSC). •It sets the chroma phase (PAL).
(11) SET UP VR (NTSC)/ BLACK LEVEL VR (PAL)	•This control adjusts the set-up level (NTSC). •It adjusts the black level (PAL).
(12) VIDEO PHASE VR	•This control adjusts the video phase.
(13) SYSTEM H VR	•This control sets the H phase of the internal sync generator to match the reference sync supplied from an external source to achieve genlock.
(14) SYSTEM SC VR	•This control sets the internal SC phase to match the reference SC supplied from an external source to achieve genlock.

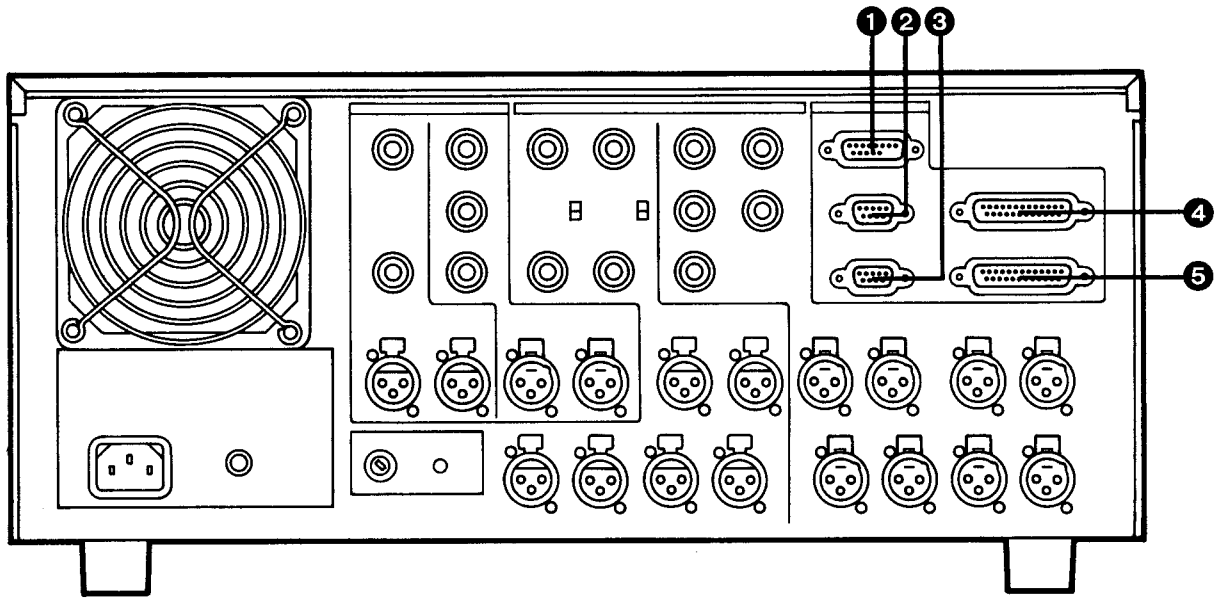
Controls and their functions (connector section)



Power supply section	
① **AC IN socket**	•This is connected to the power outlet using the accessory power cable.
② **GND terminal**	•When this VTR is connected to another unit, it must be grounded.
Digital signal input section	
③ **SERIAL IN connectors (BNC×2, active through)**	•Serial/digital signals conforming to the SMPTE 259M standard are supplied to these connectors.
④ **AUDIO IN connectors (XLR 3P×2)**	•Supply digital audio signals conforming to AES/EBU standards to these connectors.
Digital signal output section	
⑤ **SERIAL OUT connectors (BNC×3)**	•Serial digital signals conforming to the SMPTE 259M standard are supplied to these connectors.
⑥ **AUDIO OUT connectors (XLR 3P×2)**	•Digital audio signals conforming to AES/EBU standards are output from these connectors.
Analog signal section	
⑦ **VIDEO IN connectors (BNC×2)**	•Supply composite video signals to these connectors. •Loop through configuration with 75Ω termination switch.

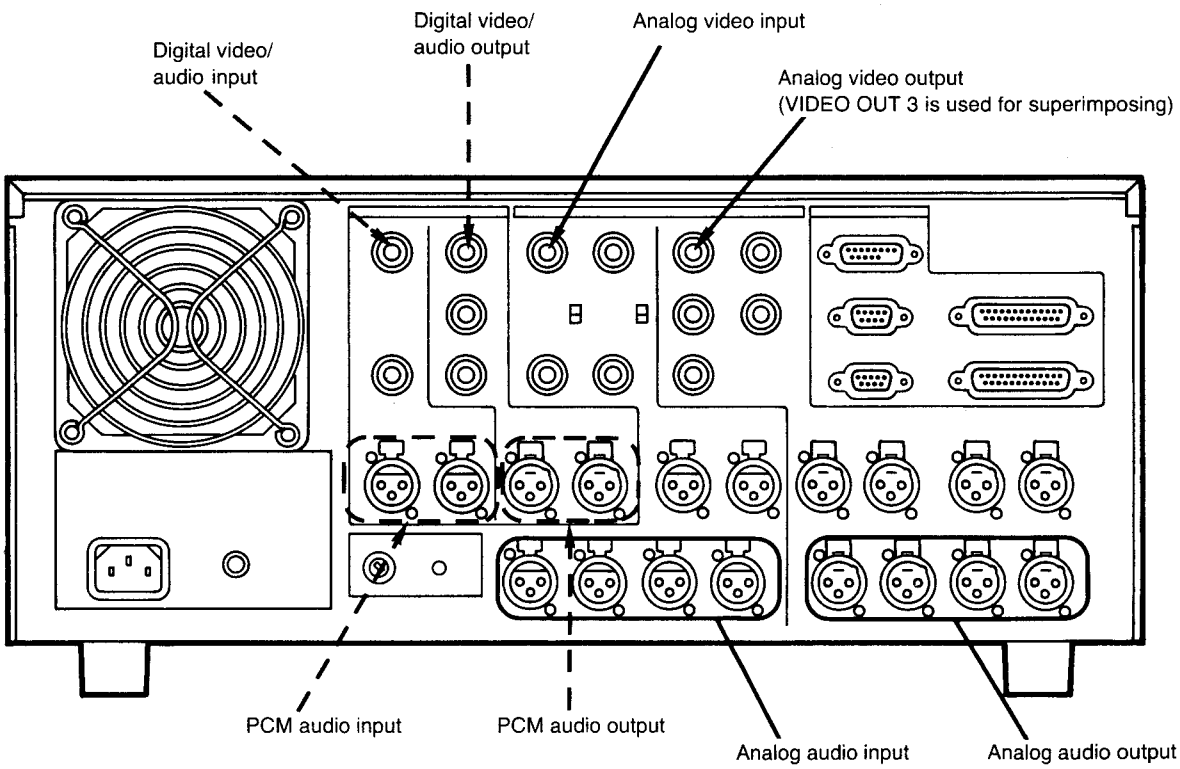


Analog signal section	
⑧ **REF VIDEO IN connectors (BNC×2)**	•Supply the reference signal to these connectors. •Loop through configuration with 75Ω termination switch.
⑨ **VIDEO OUT connectors (BNC×3)**	•VIDEO OUT 1 (VB/VBS): A video signal (VBS) with sync/burst or without sync or burst can be selected as the output from this connector. •VIDEO OUT 2: A composite signal is output. •VIDEO OUT 3: A time code, etc. can be superimposed.
⑩ **WFM OUT connector (BNC)**	•This outputs the signal to the waveform monitor.
⑪ **SC OUT connector (BNC)**	•This outputs the subcarrier signal.
⑫ **TIME CODE IN connector (XLR 3P)**	•The time code signal is supplied to this connector.
⑬ **CUE IN connector (XLR 3P)**	•The audio signal for the analog cue channel is supplied to this connector.
⑭ **AUDIO IN connectors (XLR 3P×4)**	•The analog audio signals to digital audio channels 1 to 4 are supplied to these connectors.
⑮ **TIME CODE OUT connector (XLR 3P)**	•This outputs the time code signal.
⑯ **CUE OUT connector (XLR 3P)**	•This outputs the audio signal from the analog cue channel.
⑰ **AUDIO OUT connectors (XLR 3P×4)**	•These output the analog audio signals from the digital audio channels 1 to 4.
⑱ **MONITOR connectors (XLR 3P×2)**	•These are for monitoring the sound. They output L and R audio signals. •The signal to be output can be selected from among the digital audio signals (CH1/CH2/CH3/CH4) and cue audio signal.



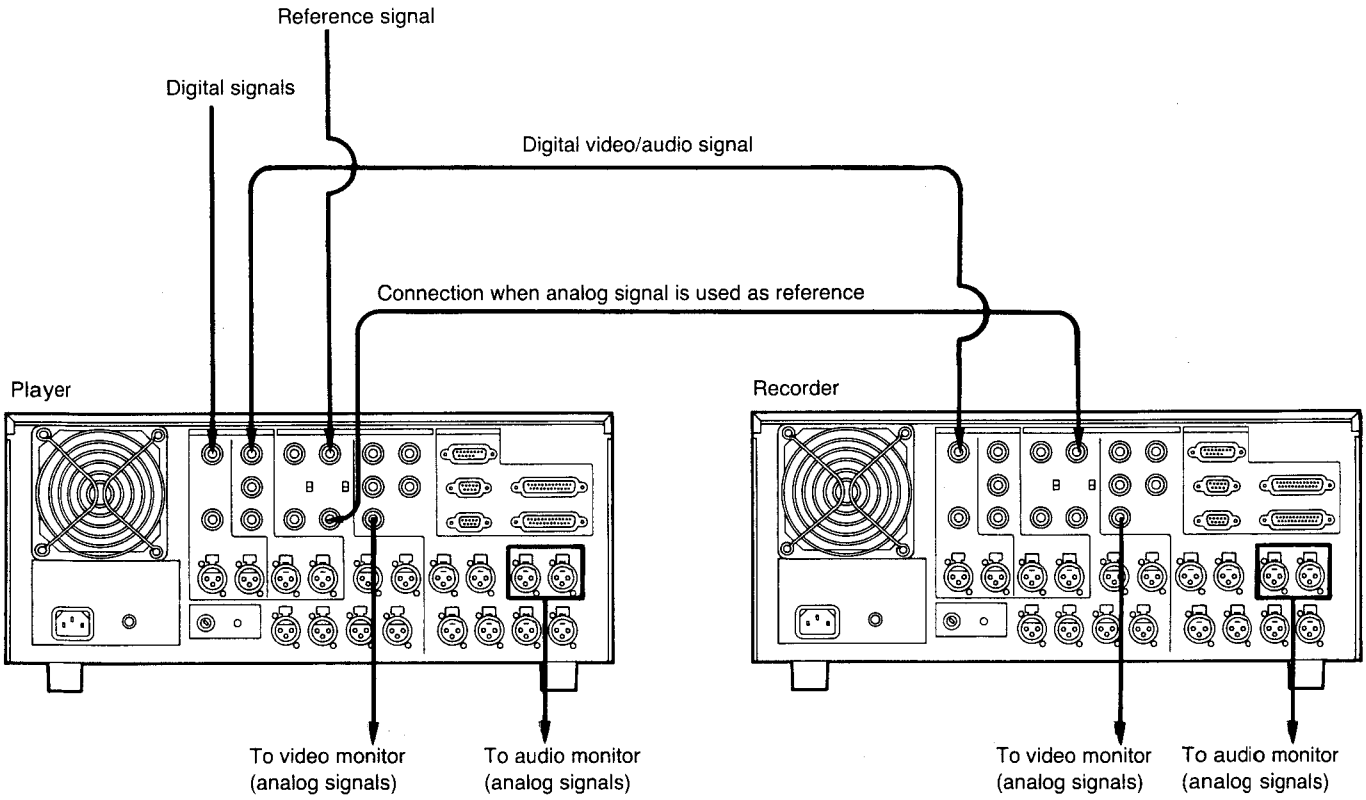
Remote control section	
❶ **V/A CONTROL connector (15P)**	•Video/audio control connector
❷ **REMOTE IN (RS-422A) connector (9P)**	•RS-422A serial remote input connector
❸ **REMOTE OUT (RS-422A) connector (9P)**	•RS-422A serial remote output connector
❹ **RS-232C connector (25P)**	•This enables a personal computer or modem to be connected for the data communication.
❺ **AUX (PARALLEL I/O) connector (25P)**	•Auxiliary connector for system expansion •It can also be used as the parallel remote connector.

Connections for recording/playback using 1 VTR

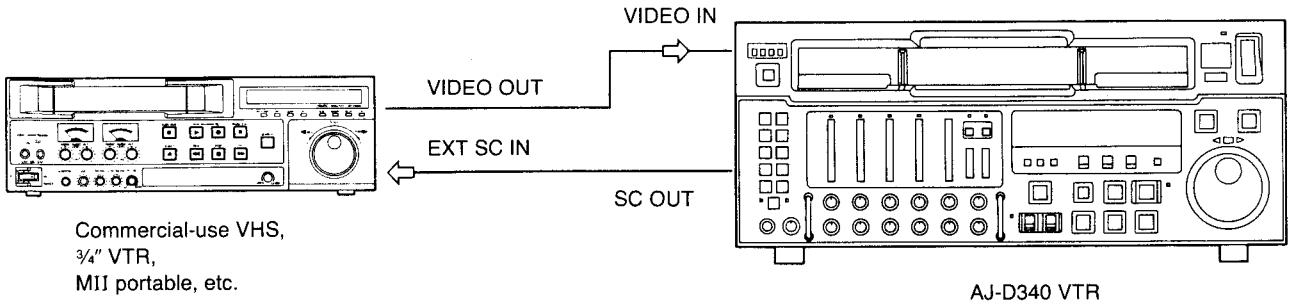


Check that the control switch has been set to LOCAL.

Connections for tape copying using 2 VTRs



Recording non-standard signals

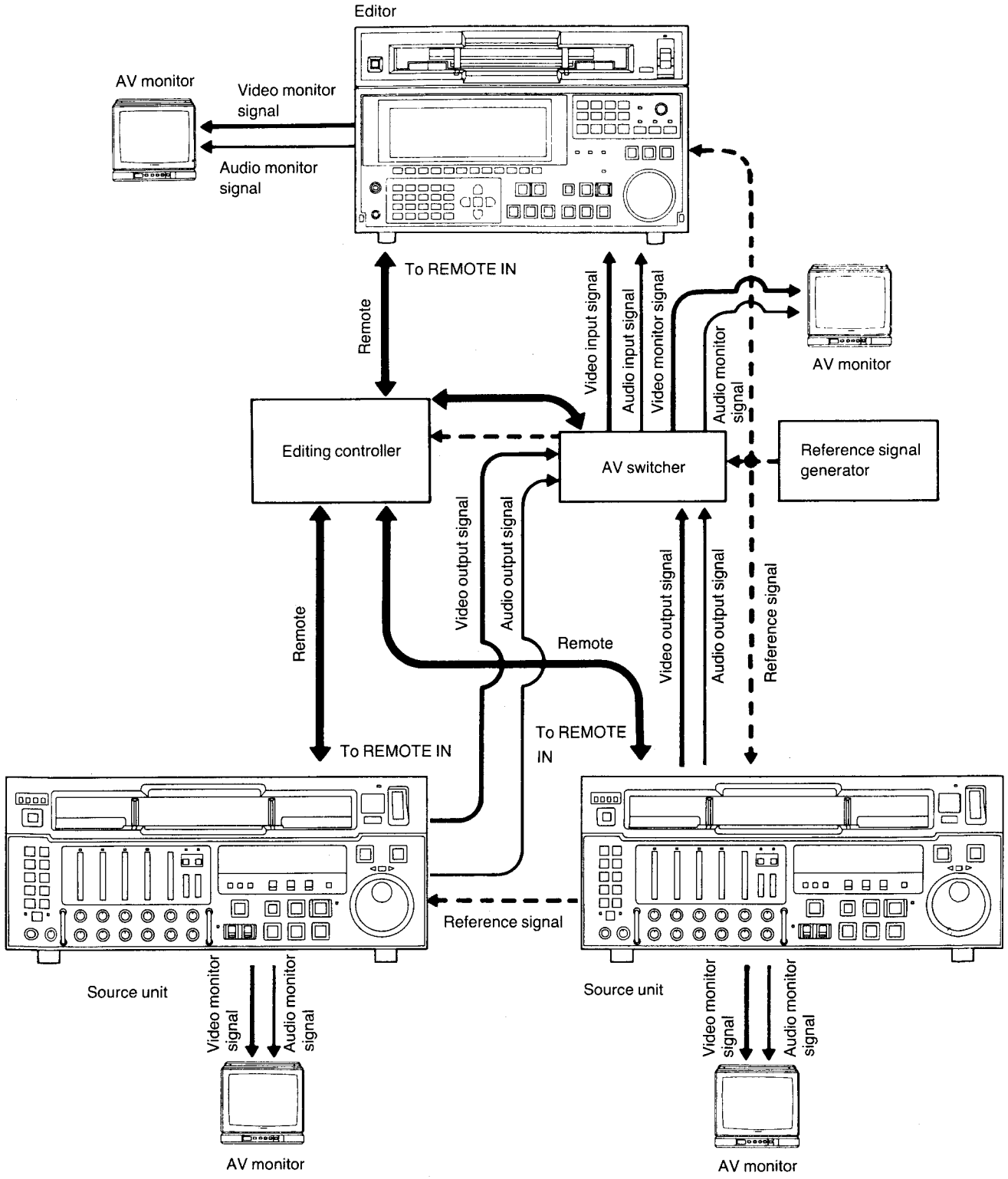


■ **Non-standard signals**

Here, "non-standard signal" refers to the playback signals which are from an analog VTR without a built-in TBC and which include an external subcarrier input.

- When this unit is connected to a VTR, such as the MII portable with its own H lock subcarrier function, connection to the external subcarrier input connector is not required.

Connection with editing controller



Set all control switches on the VTRs connected to REMOTE.

Selecting the video input signal

1 **Select the input signal.**

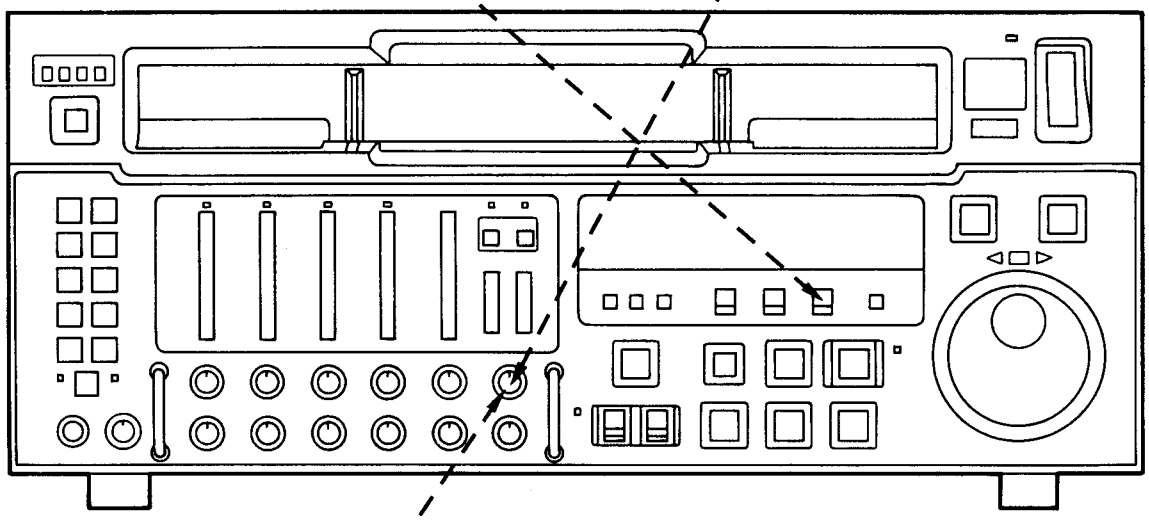
VIDEO
DIGITAL
ANALOG

Set the INPUT VIDEO switch to DIGITAL or ANALOG.

2 **Recording level adjustment**

VIDEO
REC

Normally, the VIDEO REC control is kept pushed in. The signals are recorded at the proper level.



2 **To adjust the recording level:**

VIDEO
REC

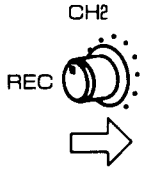
Pull out the control and adjust the level not across −3 dB and +3 dB range.

Selecting the audio input signal

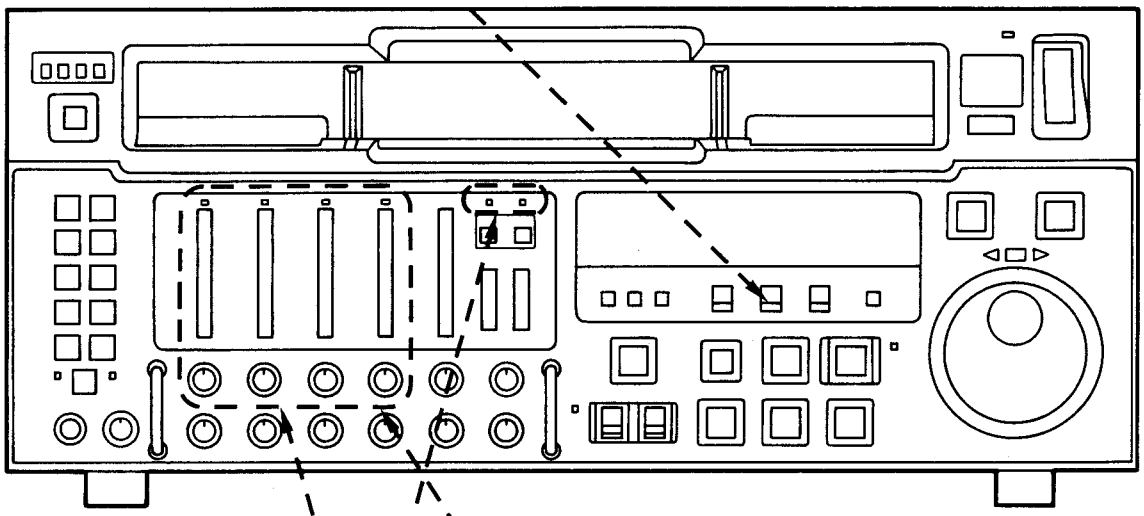
1 **Select the input signal.**

Set the INPUT AUDIO switch to DIGITAL or ANALOG.
At the USER SET position, operation then moves on to on-screen setting.
(See "D Audio" on page 59.)

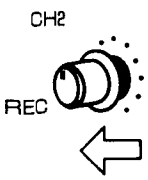
2 **Recording level adjustment**



Normally, the CH2 REC control is kept pushed in. The signals are recorded at the proper level.



To adjust the recording level:



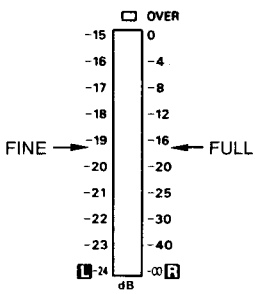
Pull out the control and adjust the level so that it does not exceed 0 dB for digital signals and −20 dB for analog signals.

When the sound is too loud:

The OVER lamp lights.

■ The level meter displays can be switched.

1. Check whether the FULL or FINE lamp is lighted.
2. When the FINE/FULL switch at the bottom of the front panel is set to FINE, the display is set to −15 to −24 dB; when it is set to FULL, it is set to 0 dB to −∞.



Setting the time code or user bits

1 **Select the TC or UB position.**

DISPLAY
CTL
TC
UB

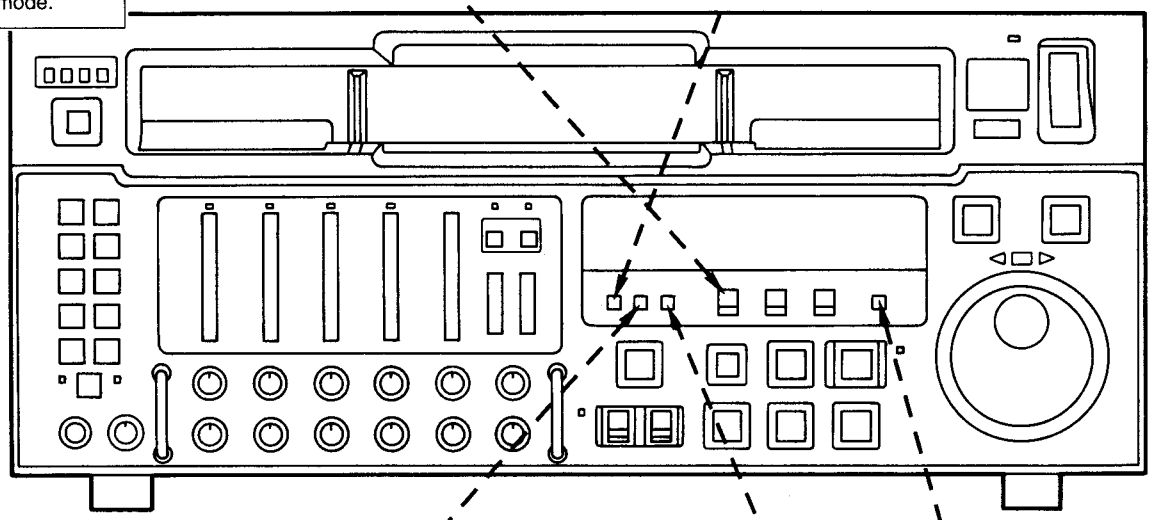
2 **Select what is to be set.**

SHIFT

When SHIFT is pressed, the counter display flashes at the far left. Each time the button is pressed, the flashing moves toward the right.

Flashing → 00 : 00 : 00 : 00

Set the VTR to the EJECT or REC/ PAUSE mode.



RESET button

3 **Enter the numerical value.**

ADJ

Each time ADJ is pressed, the value is incremented.

01 : 00 : 00 : 00

The value is incremented.

4 **Entering the setting**

START

The value is set by pressing START.

01 : 00 : 00 : 00

- Setting range for control signal:

  −9:59:59:29 to 19:59:59:29 (NTSC)
  −9:59:59:24 to 19:59:59:24 (PAL)

- Setting range for time code:

  00:00:00:00 to 23:59:59:29 (NTSC)
  00:00:00:00 to 23:59:59:24 (PAL)

- Setting range for user bits (hexadecimal notation):

  00:00:00:00 to FF:FF:FF:FF

  The letters of the alphabet appear as A, b, c, d, E, F.

■ Resetting to "0"

Press the RESET and SHIFT buttons simultaneously to set the time code/user bits to "0".

Entering cue points (AUTO mode)

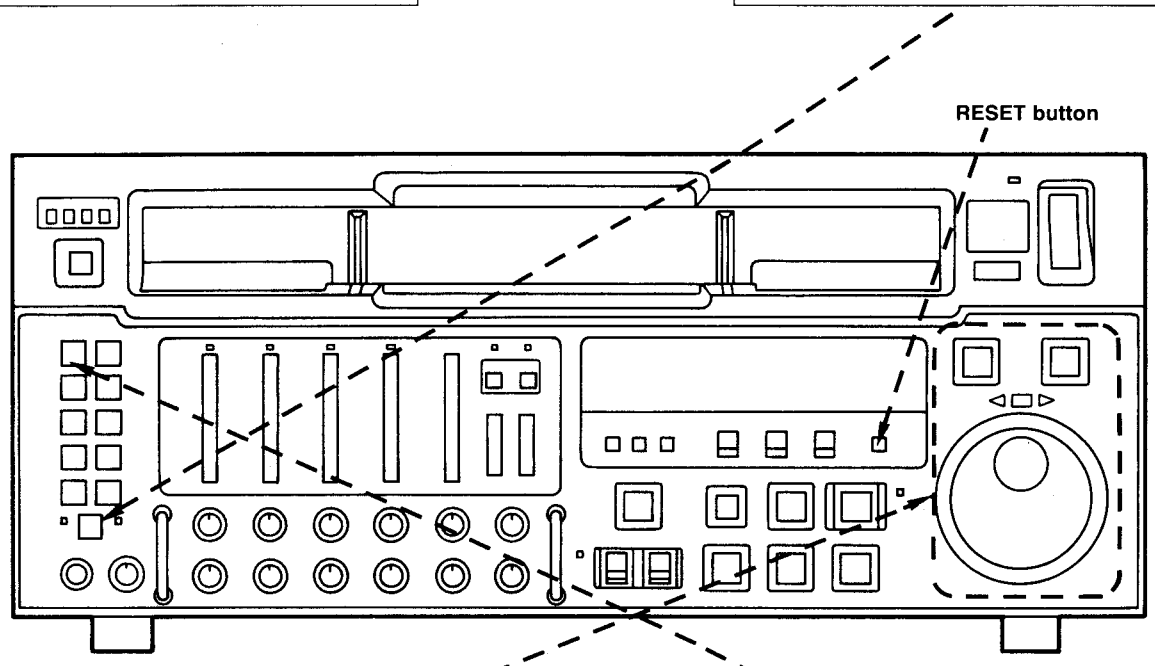
1 **Select the mode.**
(The steps below apply when the AUTO mode is to be selected.)

Select the AUTO mode on-screen.
(See "Cue Set" on page 57.)

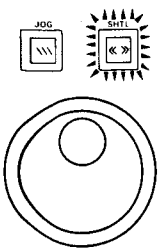
2 **Select the CUE mode.**

Press CUE.

The CUE lamp lights.



3 **Search for the cue point.**



Use the dial. Change from the shuttle to the jog mode and turn the dial.

4 **Enter the cue point.**

Press CUE SET.

The entered number lights, the number is incremented and the next number to be entered flashes.

■ **Referencing an entered cue point**
Press the cue number button. The entered time code now appears on the display.

■ **Changing an entered cue point**
Enter the cue point again. (Repeat steps 3 and 4.)

■ **Clearing a cue point**
Press the number button and RESET button simultaneously.

■ **Clearing all cue points**
Press the CUE SET and RESET buttons simultaneously.

Entering cue points (NORMAL mode)

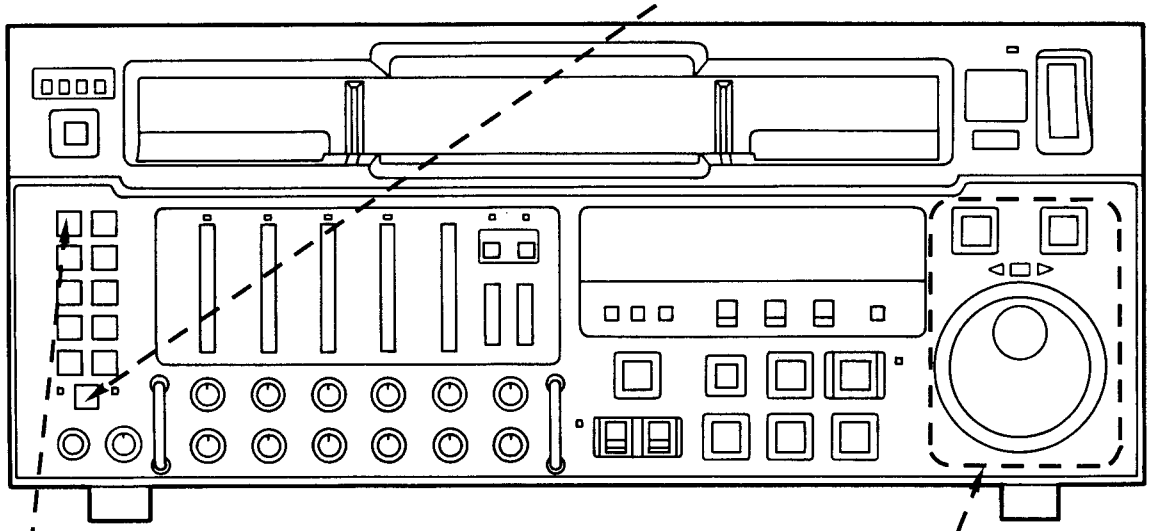
1 **Select the mode.**
(The steps below apply when the NORMAL mode is to be selected.)

Select the NORMAL mode on-screen.
(See "Cue Set" on page 57.)

2 **Select the CUE mode.**

Press CUE.

The CUE lamp flashes.

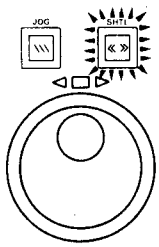


3 **Establish the cue point entry mode.**

Press CUE SET.

The CUE SEARCH lamp goes off and the CUE SET lamp lights.

4 **Search for the cue point.**



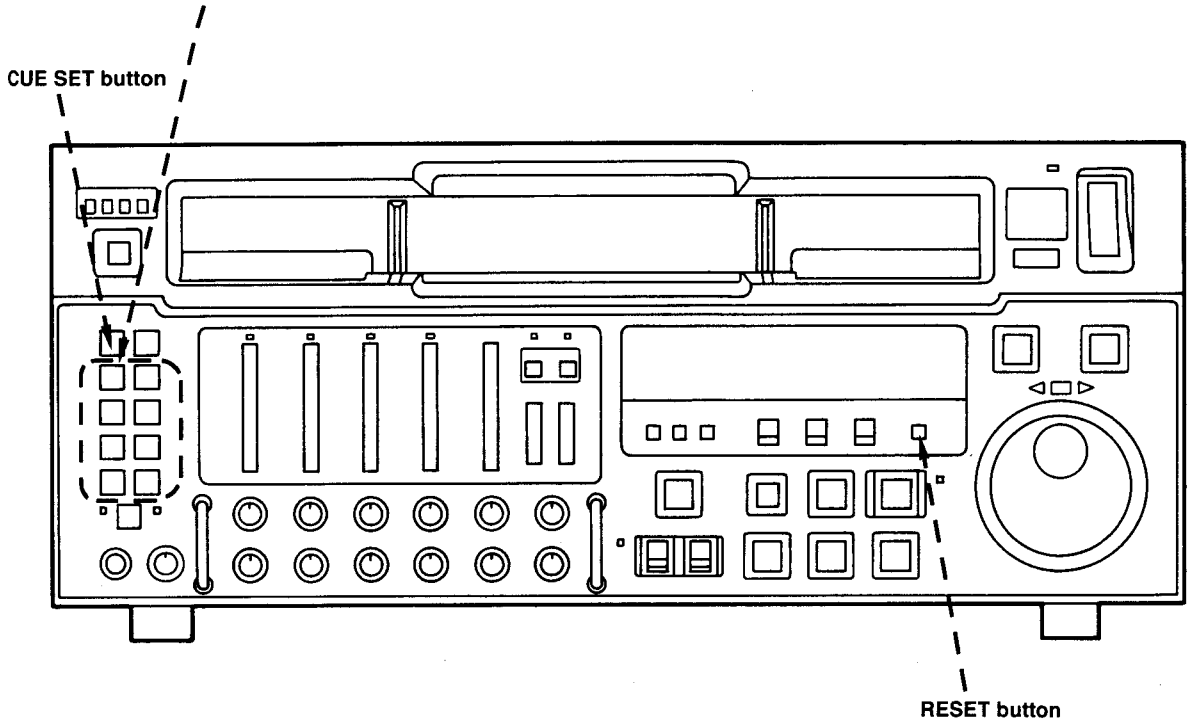
Use the dial. Change from the shuttle to the jog mode and turn the dial.

Entering cue points (NORMAL mode) (cont.)

5 **Press the number button for the cue number to be entered.**

Press [4] [CTL] . (Example)

The number lamp lights.



■ **Cue points can be entered by number buttons 1 to 8.**

■ **Referencing an entered cue point**
Press the CUE SET and number button simultaneously. The entered time code now appears on the display.

■ **Changing an entered cue point**
Enter the cue point again. (Repeat steps 4 and 5.)

■ **Clearing a cue point**
Press the number button and RESET button simultaneously.

■ **Clearing all cue points**
Press the CUE SET and RESET buttons simultaneously.

Searching for cue points (AUTO mode)

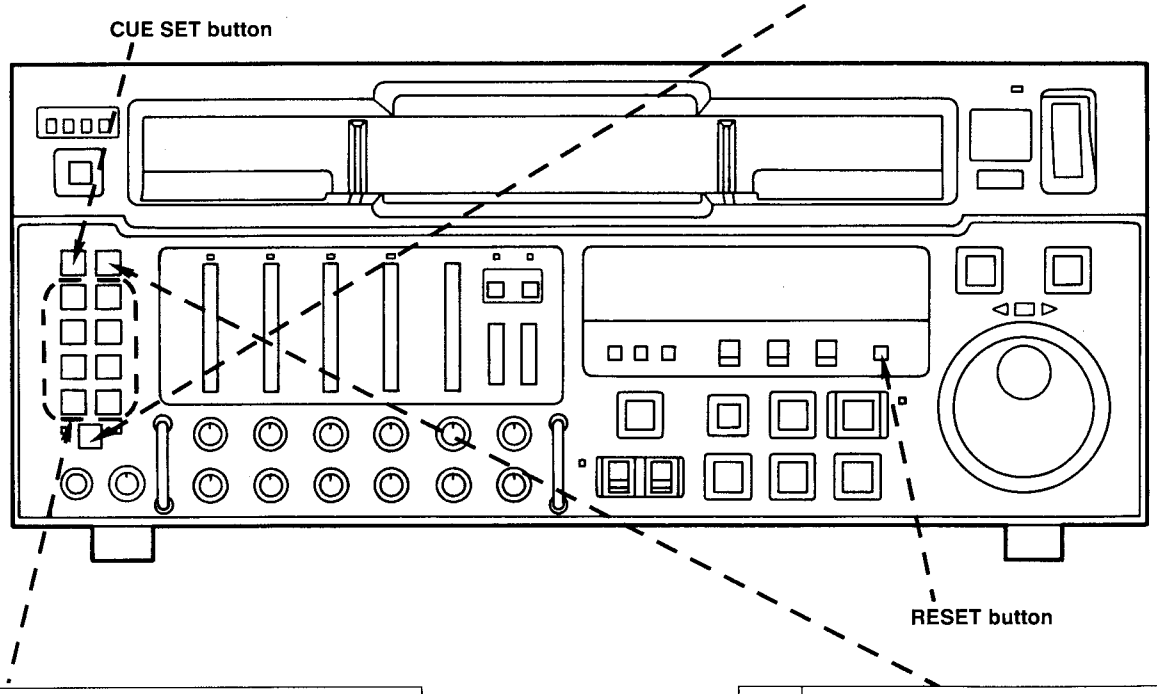
1 **Select the mode.**
(The steps below apply when the AUTO mode is to be selected.)

Select the AUTO mode on-screen.
(See "Cue Set" on page 57.)

2 **Select the CUE mode.**

Press CUE.

The CUE lamp lights.



3 **Press the number button corresponding to the cue point to be searched.**

Press EYE2 7 . (Example)

The number lamp flashes.

4 **Search for the cue point.**

Press CUE SEARCH.

The CUE SEARCH and SHTL lamps light and the cue point is searched.

■ **Referencing an entered cue point**
Press the corresponding number button. The entered time code now appears on the display.

■ **Clearing a cue point**
Press the number button and RESET button simultaneously.

■ **Clearing all cue points**
Press the CUE SET and RESET buttons simultaneously.

Searching for cue points (NORMAL mode)

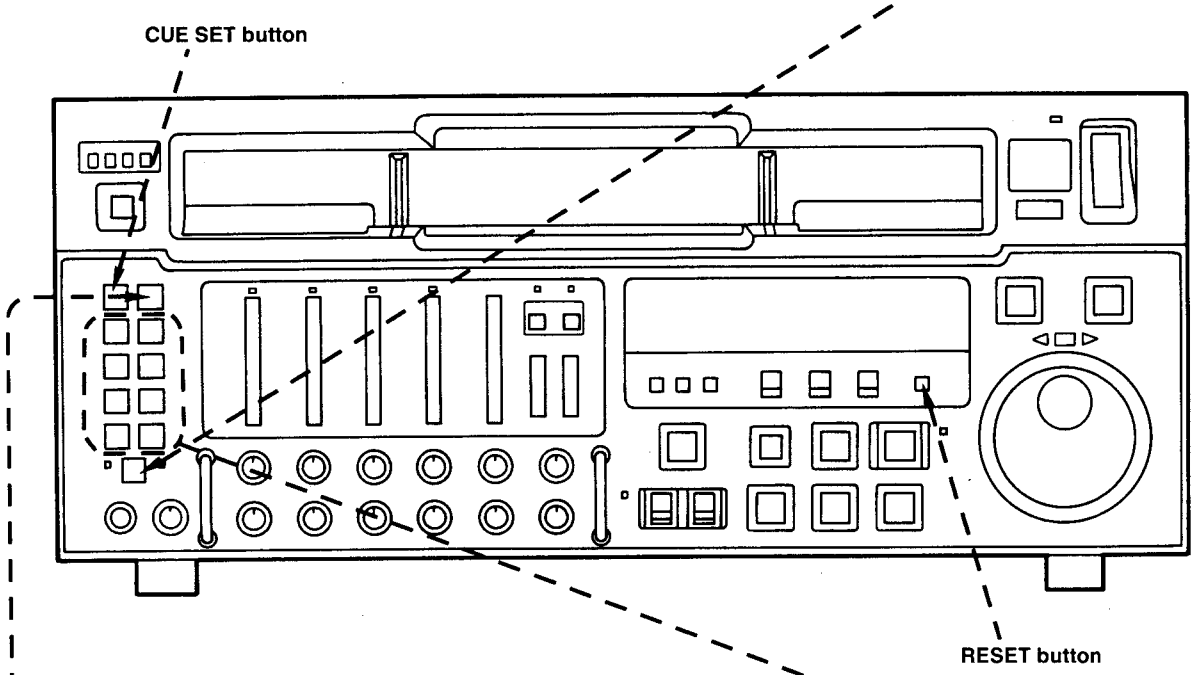
1 **Select the mode.**
(The steps below apply when the NORMAL mode is to be selected.)

Select the NORMAL mode on-screen.
(See "Cue Set" on page 57.)

2 **Select the CUE mode.**

Press CUE.

The CUE lamp flashes.



3 **Set to the cue point search mode.**

Press CUE SEARCH.

The CUE SEARCH lamp lights and the CUE SET lamp goes off.

4 **Press the number button corresponding to the cue point to be searched.**

Press OUT 5. (Example)

The SHTL lamp lights and the cue point is searched.

■ **Referencing an entered cue point**
Press the CUE SET and cue number button simultaneously. The entered time code now appears on the display.

■ **Clearing a cue point**
1. Press the CUE SET button.
2. Press cue number button to be cleared and RESET button simultaneously.

■ **Clearing all cue points**
Press the CUE SET and RESET buttons simultaneously.

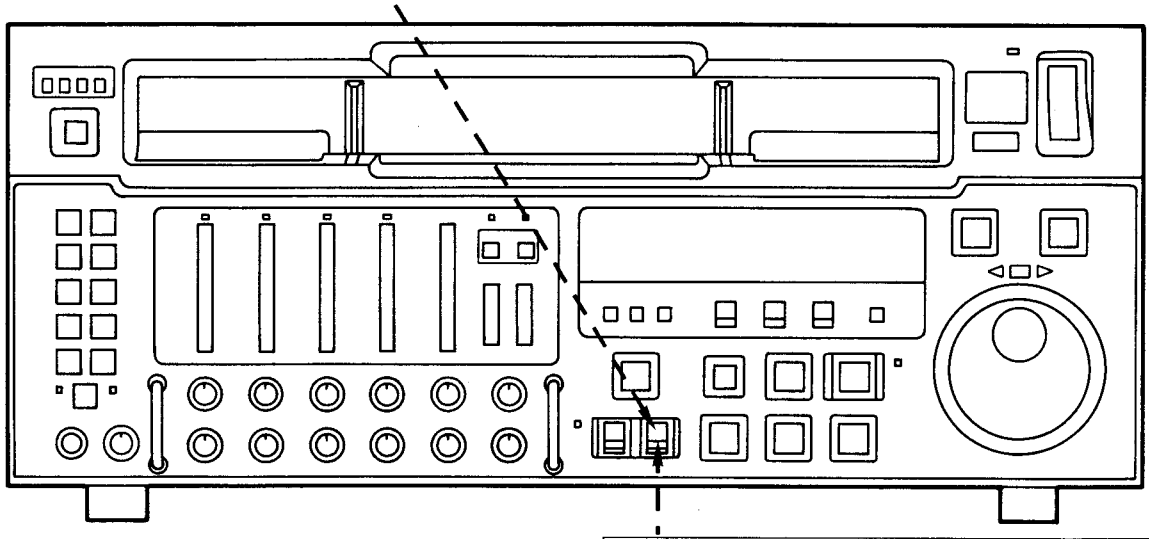
Video monitoring

1 **Monitor the playback pictures on the tape.**

MODE
TAPE
EE

Set to TAPE.

MODE	REC	READY/ STOP	PLAY/ SEARCH	EJECT
Picture	Simult. playback	Still	Playback	—



2 **Monitor the input signals.**

MODE
TAPE
EE

Set to EE.

MODE	REC	READY/ STOP	PLAY/ SEARCH	EJECT
Picture	EE	EE	Playback	EE

CAUTION

When the picture is switched to another mode, the sound is switched as well.

Switch \ Operation	Signal	EJECT		LOADING		UNLOADING		STOP	STBY-OFF	PLAY	REC/PLAY	JOG SHTL FF/REW
		Immediately after power ON	After tape travel	Immediately after power ON	After tape travel	Immediately after power ON	After tape travel					
TAPE	VIDEO	MUTE	FREEZE	MUTE	FREEZE	MUTE	FREEZE	TAPE	FREEZE	TAPE	TAPE	TAPE
	PCM	MUTE	MUTE	MUTE	MUTE	MUTE	MUTE	MUTE	MUTE	TAPE	TAPE	MUTE
	CUE	TAPE	TAPE	TAPE	TAPE	TAPE	TAPE	TAPE	TAPE	TAPE	EE	TAPE
EE	VIDEO	EE	EE	EE	EE	EE	EE	EE	EE	TAPE	EE	TAPE
	PCM	EE	EE	EE	EE	EE	EE	EE	EE	TAPE	EE	MUTE
	CUE	EE	EE	EE	EE	EE	EE	EE	EE	TAPE	EE	TAPE

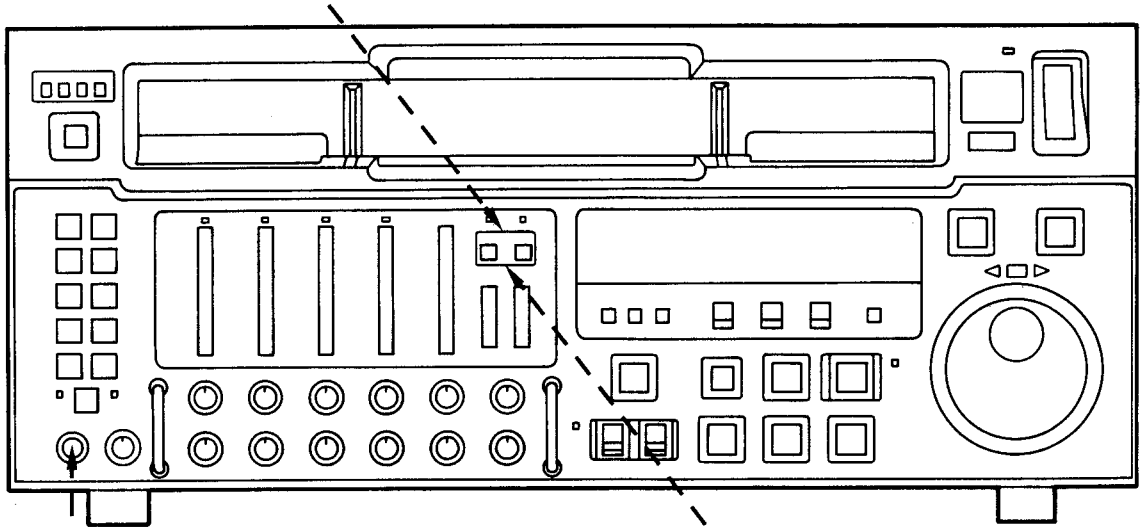
1) **After tape travel:** This means after the tape has traveled and the video signal has been detected.
2) The muting status is established when setting the TAPE/EE switch to EE and then back to TAPE in the FREEZE mode.

MUTE: Picture is muted.
TAPE: Signals recorded on tape are played back.
FREEZE: The picture played back at the moment when FREEZE was selected is memorized for playback as a still picture.

Audio monitoring

1 **Select the channel whose sound is to be monitored.**

Press [L] or [R] .



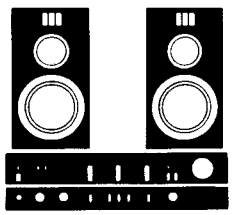
Plug the headphones into this jack.

The headphones level can be adjusted when headphones have been plugged in. (See Note 2.)

2

Each time [L] or [R] is pressed, the channel selected changes in the order of CH1, CH2, CH3, CH4 and cue.

Note 1: The monitoring sound is output through the MONITOR connector in the connector section.
When this connector is connected to an amplifier, the sound can be monitored through speakers.

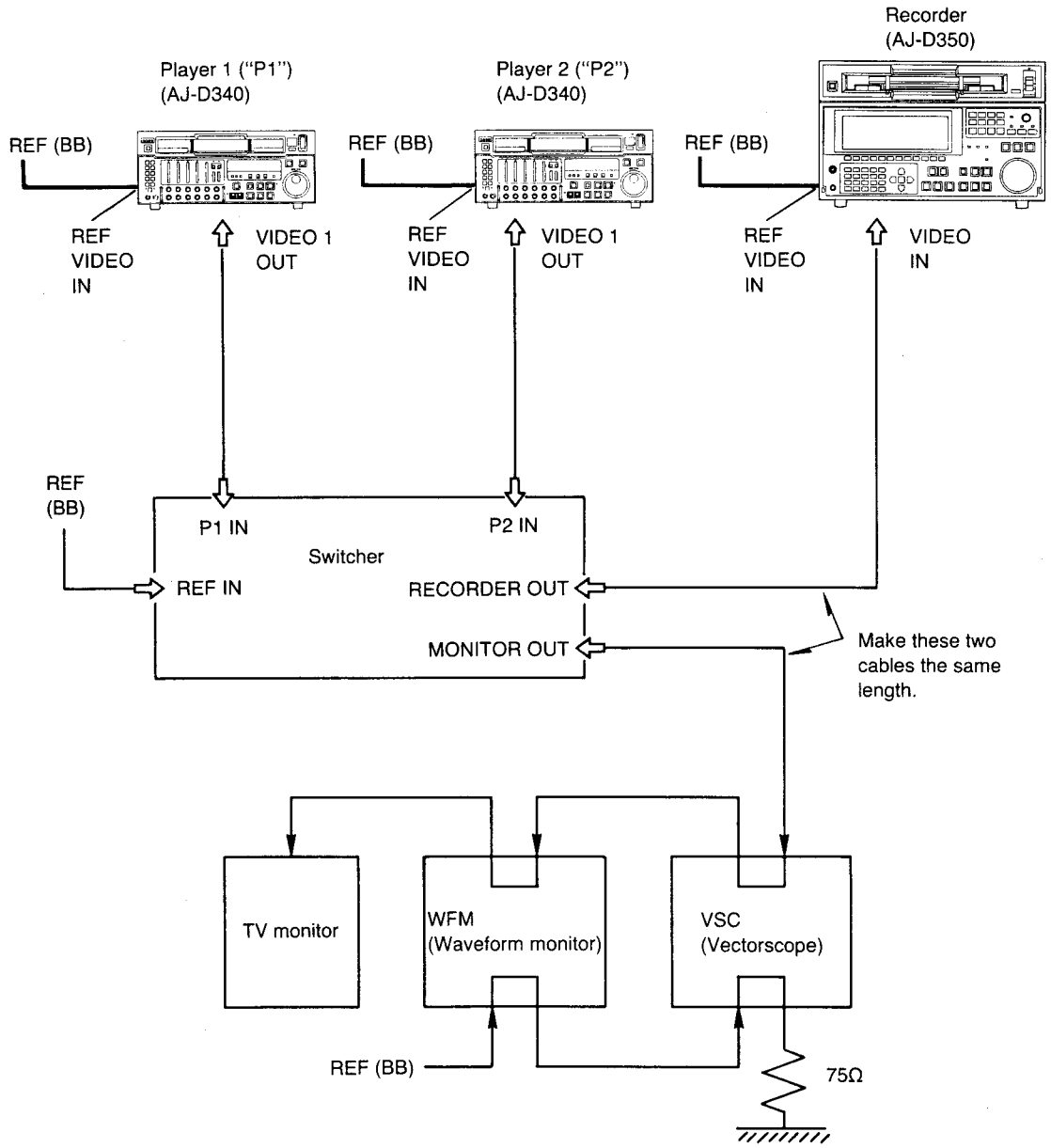


Note 2: Bear in mind that the output level of the MONITOR connector in the connector section will also change as the headphones level is adjusted.

Adjusting the output video signal level

For AB roll editing, adjust the output of the connected system's video signals in order to ensure error-free editing.

1 Connect the equipment.



Notes:

- Supply an external reference signal from a sync signal generator to the equipment.
- Use composite connections for the receive signals.
- The vectorscope or waveform monitor can also be connected to the WFM connector on the recorder.

2 Adjusting the video output signals of the source units

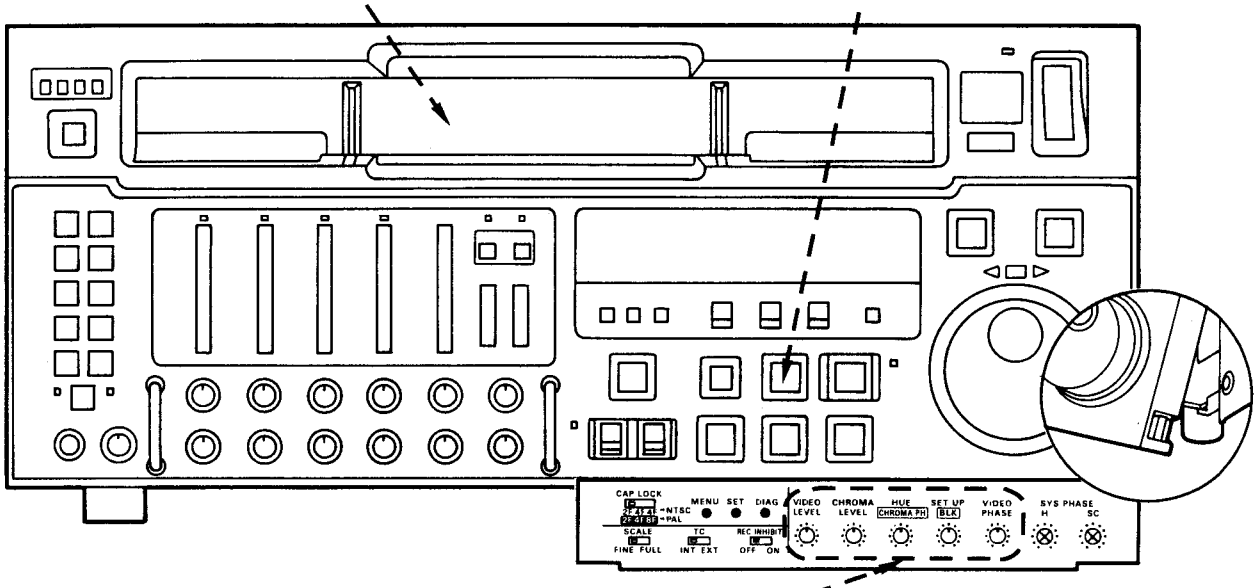
1 **Load a tape with standard color bar signals recorded.**

2 **Play back the tape.**

PLAY

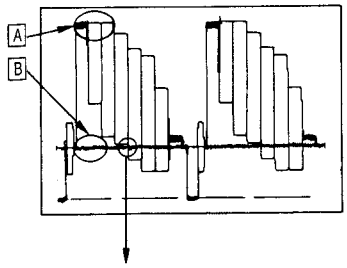
Press ▶ .

The lamp lights.

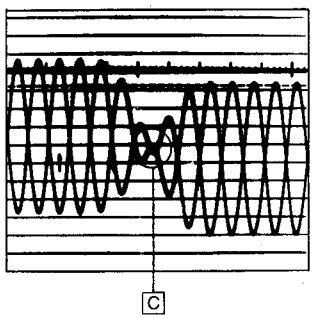


3 **Adjust the controls in such a way that the waveforms appear on the vectorscope and waveform monitor as shown below.**

Waveforms on waveform monitor (WFM)



Expanded view of boundary between green and magenta



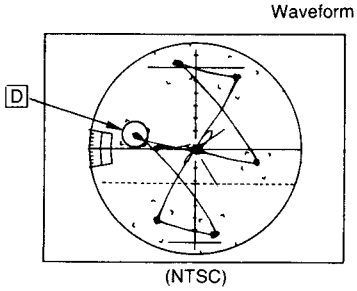
A Video level
Adjust this to 100 IRE (NTSC)/700 mV (PAL).

B Chroma and hue (NTSC)/chroma phase (PAL)
Insert the trace of the vector waveforms into the marked area by adjusting the two controls.

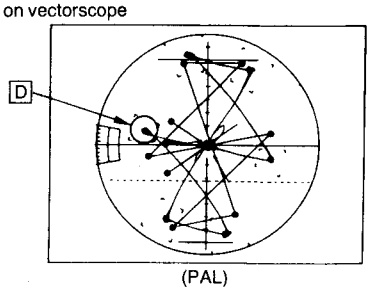
C Video phase
1) Set the WFM to the INT mode and expand to 0.1 µs.
2) Check the position of the boundary between green and magenta.
3) Set the WFM to the EXT mode.
4) Adjust the VIDEO PHASE control so that the the boundary between green and magenta is aligned with its previous position.

D Set-up (NTSC)/black level (PAL)
Adjust in such a way that deviation is eliminated.

Waveform on vectorscope



(NTSC)



(PAL)

3 Adjusting the phase of the overall system

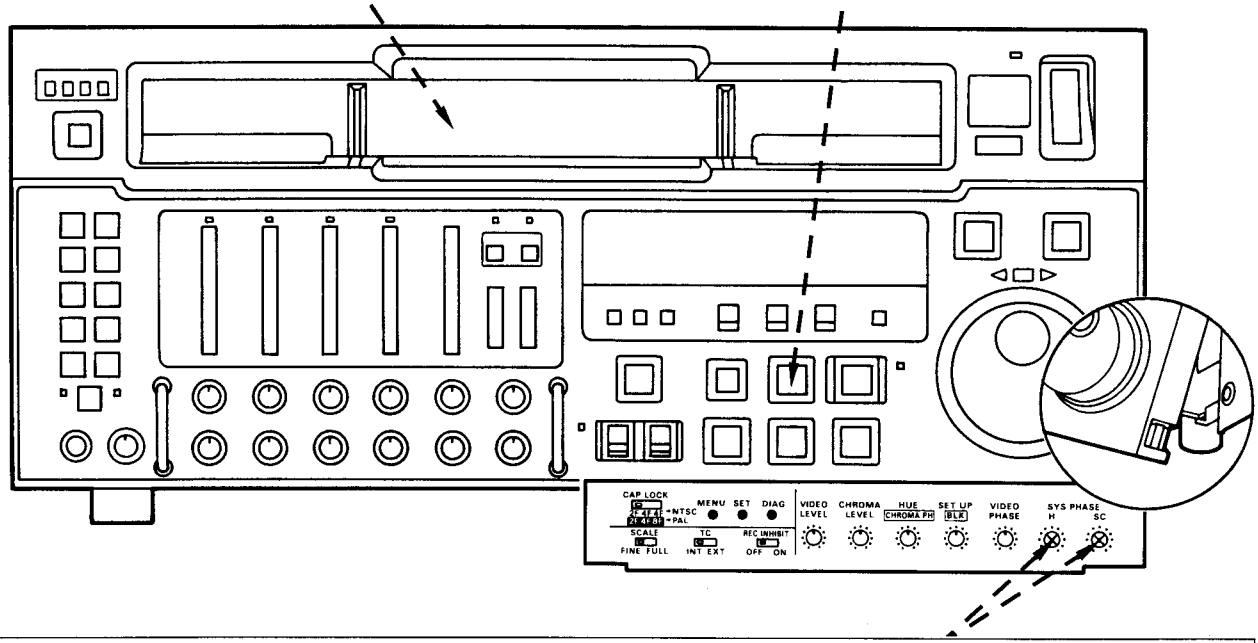
1 **Load a tape with standard color bar signals recorded into the P1 VTR.**

2 **Play back the tape.**

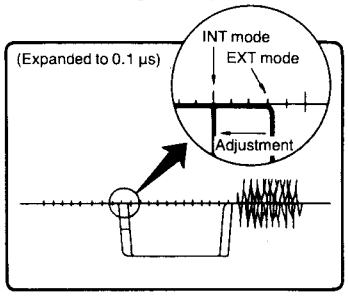
PLAY

Press ▶ .

The lamp lights.



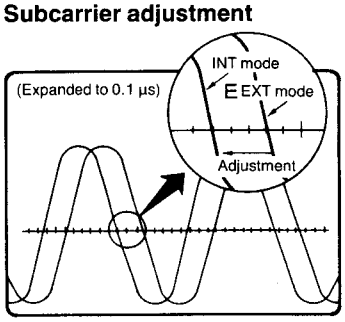
3 **Horizontal sync adjustment**



(Observe the SYNC fall.)

1) Set the WFM to the INT mode and expand to 0.1 µs.
2) Check the H SYNC position.
3) Now set the WFM to the EXT mode.
4) Adjust the H control in such a way that H SYNC is aligned with its previous position.
5) Adjust the system phase of the P2 VTR in the same way.

4 **Subcarrier adjustment**



(Observe the BURST fall.)

1) Set the WFM to the INT mode and expand to 0.1 µs.
2) Check the BURST position.
3) Now set the WFM to the EXT mode.
4) Adjust the SC control in such a way that BURST is aligned with its previous position.
5) Adjust the subcarrier of the P2 VTR in the same way.

Checking the output signal waveforms

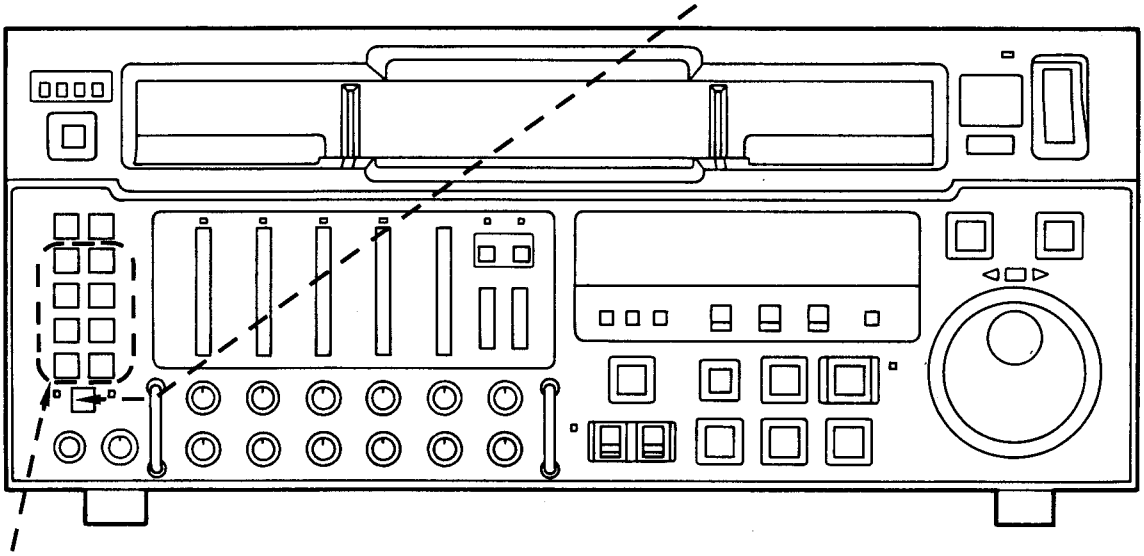
1 **Connections**

WFM connector ○ —— VIDEO INPUT — Waveform monitor

2 **Select the WFM mode.**

Press WFM.

The WFM lamp lights.



3 **Select the signal to be output.**

Press [2] [ENV1] . (Example)

The selected signal is output from the WFM connector.

Recording

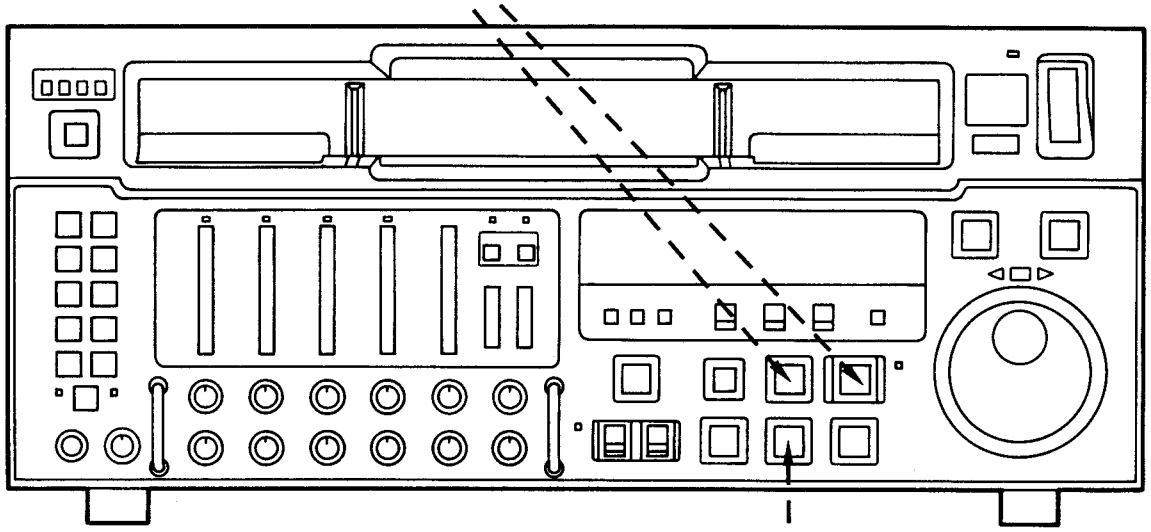
1 **Starting to record**

PLAY

Press ▶ while keeping REC ●

depressed.

The REC and PLAY lamps light, and recording commences.



2 **Ending the recording**

STOP

Press ■ .

The STOP lamp lights, and the recording is ended.

•Check out the following points before recording.

—Is the REC INHIBIT lamp lighted?

→1. Set the REC INHIBIT switch to OFF.

→2. Has the cassette's accidental erasure prevention pin been released?

—Any slack in the cassette tape?

Playback

1 **Starting playback**

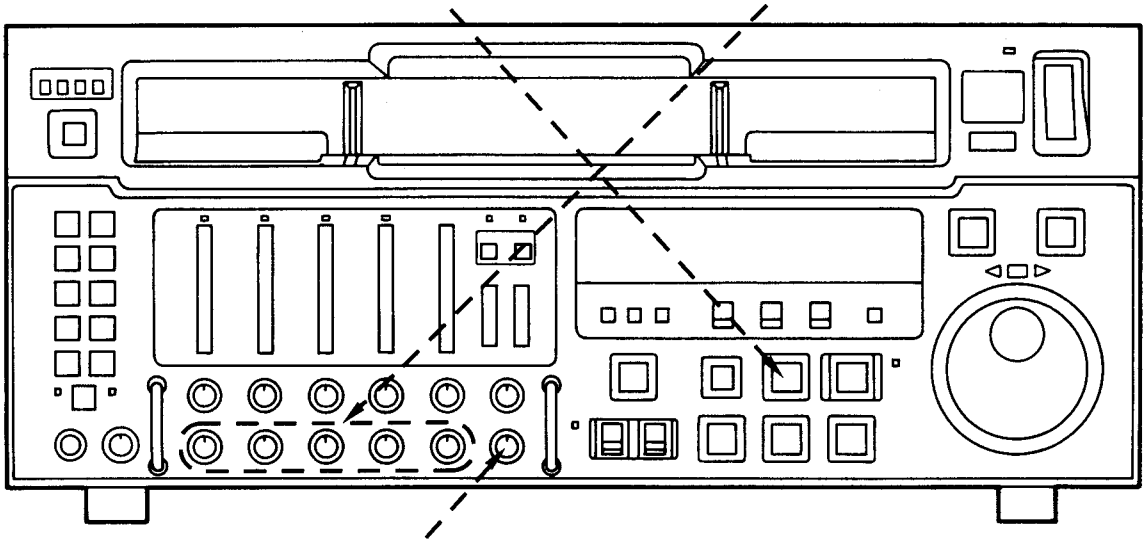
PLAY

Press ▶ .

The lamp lights, and playback commences.

2 **To adjust the audio signal level:**

Pull out the control and adjust the level. (See Note 1.)



When all the audio signal levels are to be adjusted together, pull out the MASTER control and adjust.

Auto tracking (See Note 2.)

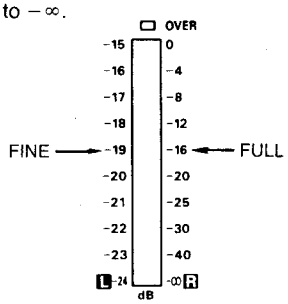
PLAY READY (STAND BY)

Press ▶ and □ simultaneously.

The PLAY lamp flashes.

Note 1: The level meter displays are selected.

1. Check that the FULL or FINE lamp is lighted.
2. When the FINE/FULL switch at the bottom of the front panel has been set to FINE, the level meters indicate the level from −15 to −24 dB; when it is set to FULL, they indicate the level from 0 dB to −∞.



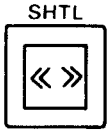
Note 2: Auto tracking operation

1. This function automatically aligns the playback head with the optimum position on the recording track.
2. It is automatically activated only when playback is performed for the first time after the cassette has been loaded.
   During the second and subsequent playback, the PLAY and READY buttons need to be pressed simultaneously to activate the auto tracking function.
3. The PLAY button flashes while the function is activated.

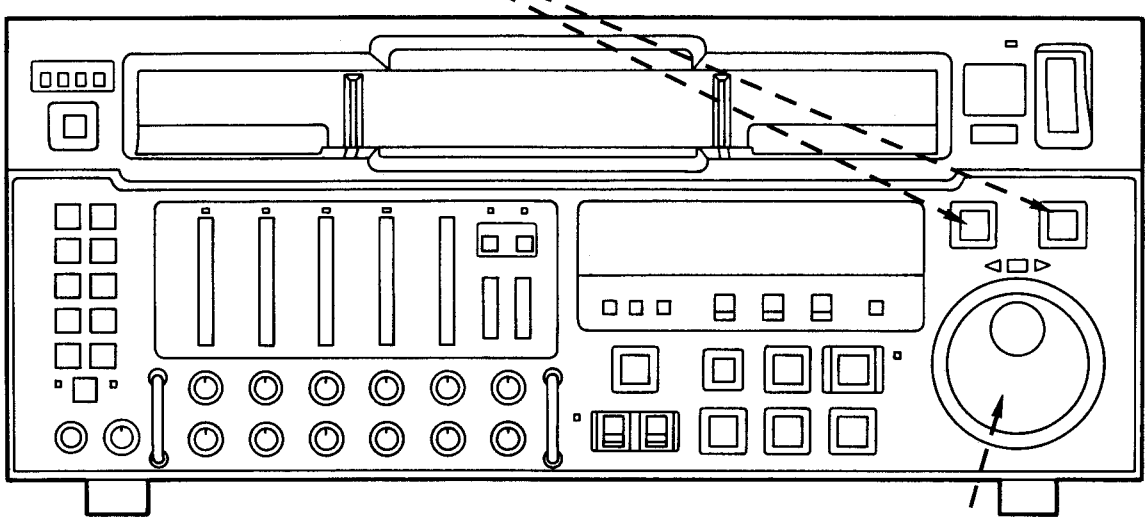
Using the JOG and SHTL buttons

1 **JOG mode and SHTL mode**

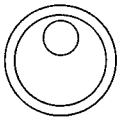
JOG SHTL

Press  or  .

The corresponding lamp lights.



2 **Selecting the tape speed**

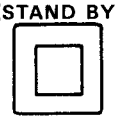


Turn the dial.

Using the READY button

1 **While the READY lamp is lighted in the stop mode**

READY
(STAND BY)

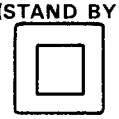
Press  .

The lamp turns off.

- The winding of the tape around the drum is released and the half loading mode is established. (See Note 1.)

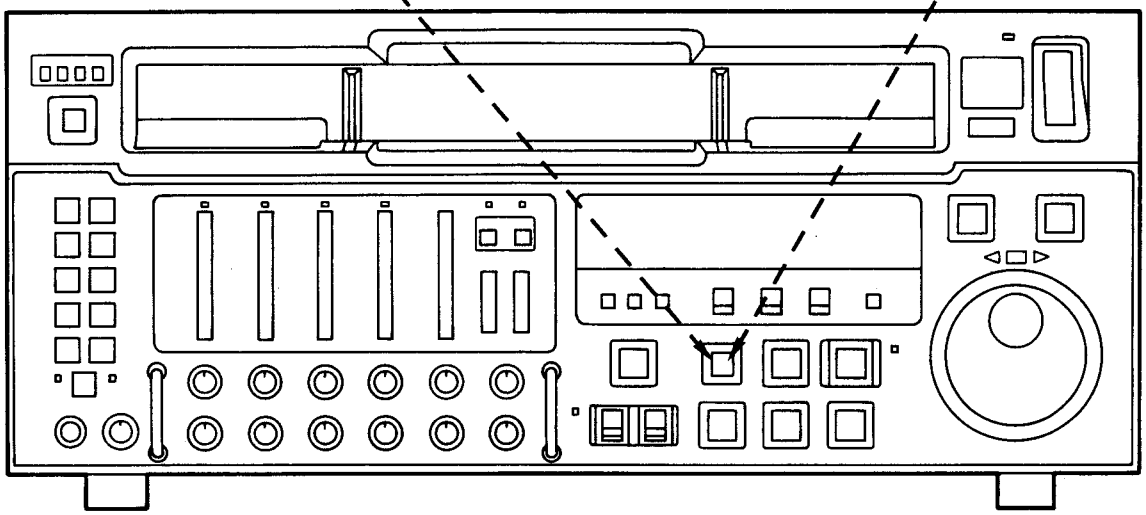
2 **While the READY lamp is off**

READY
(STAND BY)

Press  .

The lamp lights.

- The tape is loaded and the READY mode is established.



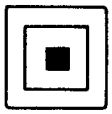
Note 1: Whether the drum is to be turned or stopped can be set on-screen. (See "Drum Mode" on page 56.)

Note 2: In the JOG/SHTL still-picture mode or stop mode, the tape tension is reduced after a fixed period of time (which can be set on-screen) has elapsed. (See "Still" on page 56.)

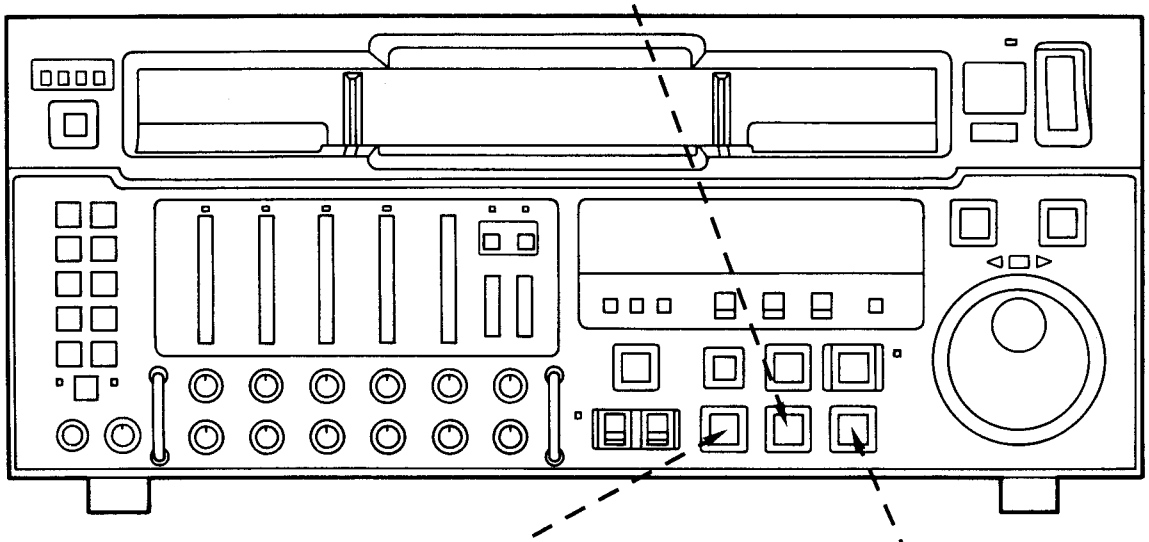
Using the STOP, REW and FF buttons

Stop mode

STOP

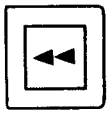
Press  .

The lamp lights, and all manner of tape travel is stopped.



Rewind mode

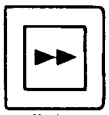
REW

Press  .

The lamp lights and the tape is rewound at a speed equivalent to about 100 times the normal play speed. (See Note 1.)

Fast forward mode

FF

Press  .

The lamp lights and the tape is fast forwarded at a speed equivalent to about 100 times the normal play speed. (See Note 1.)

Note 1: The tape speed can be set on-screen.
(See "Max Speed" on page 63.)

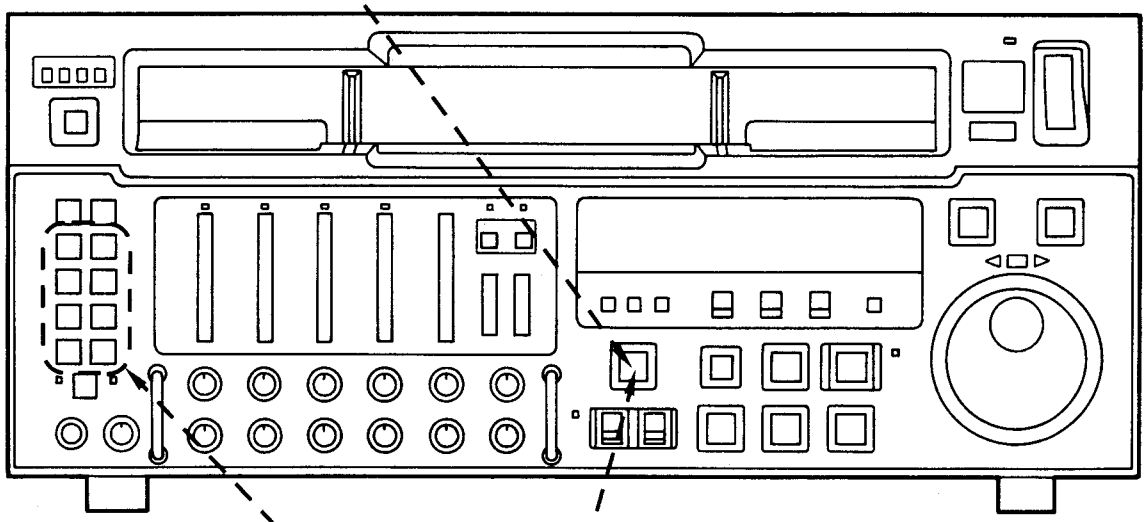
Using the PREROLL button

Fixing the preroll point

Press PREROLL .

The lamp lights, the tape is reversed for a predetermined time (called the preroll time), and then it stops.

The "predetermined time" can be set on-screen. (See "Preroll" on page 56.)



Using the PREROLL button in conjunction with cue search signal (AUTO mode)

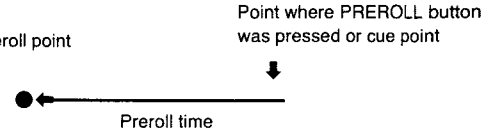
First press number TC 8 (example)

button and then press PREROLL .

Using the cue point as a reference, the tape comes to a halt at the preroll point.

■ **Preroll point**

The preroll point is the position to which the tape is made to return after it has been run for the "predetermined time" by pressing the PREROLL button.



Menu screen set-up ■ The menu screen is activated in the eject mode.

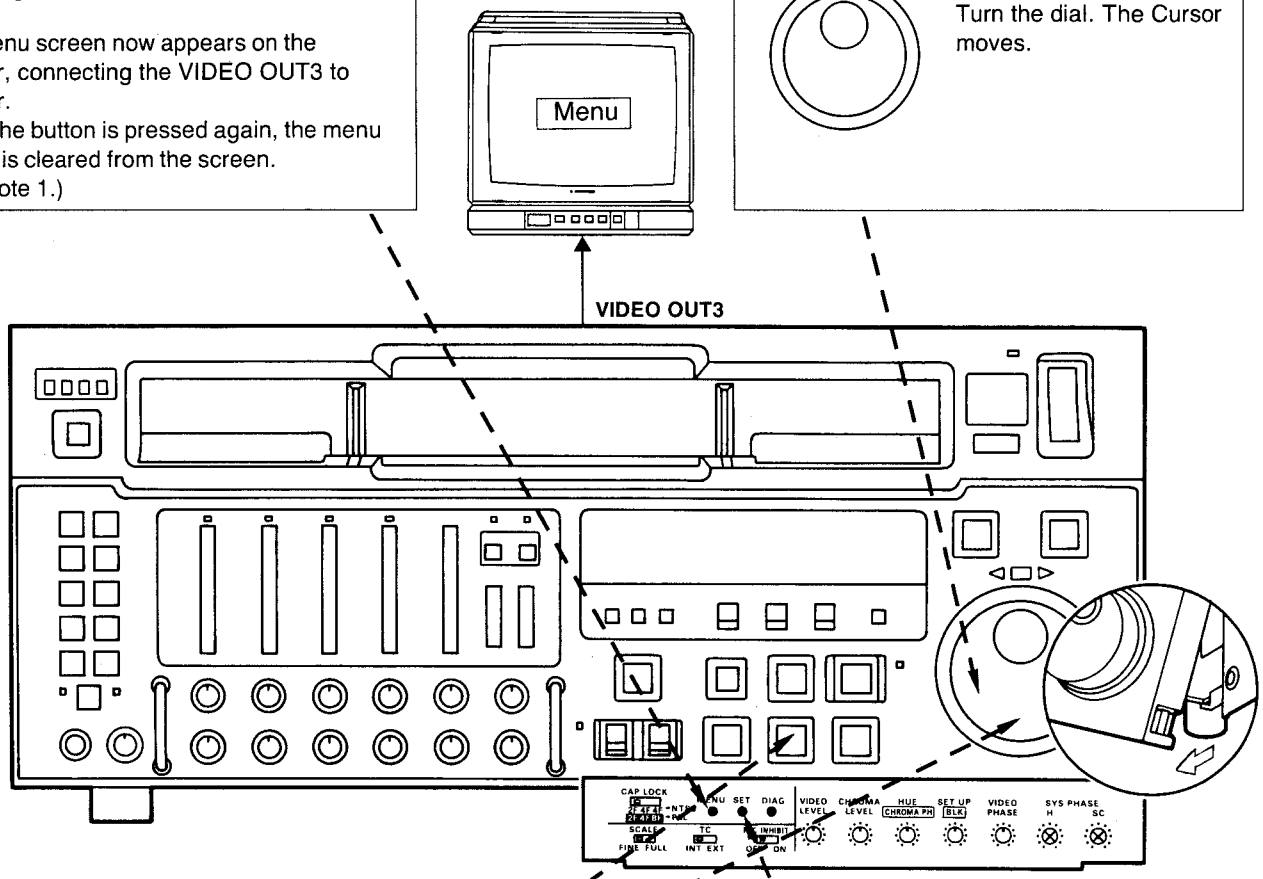
1 **Display the menu screen.**

Press MENU ●.

The menu screen now appears on the monitor, connecting the VIDEO OUT3 to monitor.
When the button is pressed again, the menu screen is cleared from the screen.
(See Note 1.)

2 **Change the setting item.**

Turn the dial. The Cursor moves.



3 **Change the setting.**

Turn the dial while keeping STOP ■ depressed.

Continue to change settings (2)–(3) if necessary.

4 **Complete the setting.**

Press SET ● when all changes have been completed.

The original screen is returned. The change takes effect and the menu screen is cleared.

Note 1: Bear in mind that the data change will not take effect if the menu screen has been cleared by the MENU button before the SET button is pressed.

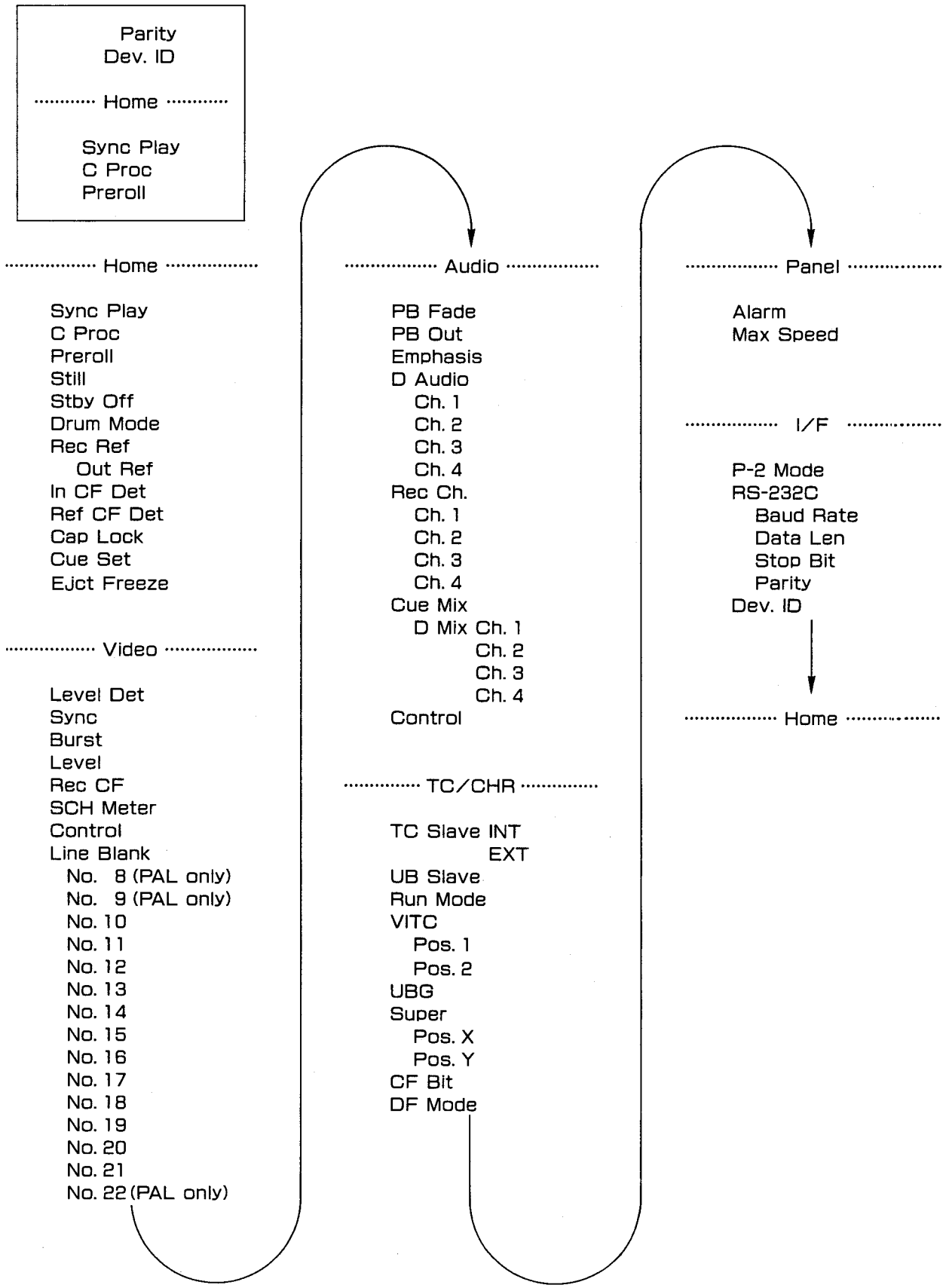
■ The setting items and modes on the menu screen are encoded and they appear also on the front panel display.
(See pages 56 to 63.)

88:88:88:88
Item Mode

4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

List of menu screens

When the dial is turned, the menu screen is scrolled up or down the screen.



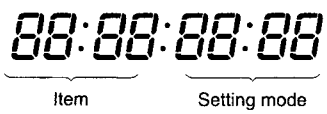
Menu items

—Home—

Item	Setting mode	Description of function
Sync Play (1010)	Off (0) On (1)	Selects sync play (playback while providing synchronization). Off: Normal playback. On: Sync play operation.
C Proc (1020)	Proc (0) Normal (1)	Maintains continuity of color frames when playing back tape on which color frames of the video signals have not been recorded continuously due to editing in frame lock mode, etc. Proc: Video phase remains unchanged even when color frames do not match but picture quality deteriorates due to chroma signal processing. Normal: Video phase moves horizontally by 140 ns (NTSC) when color frames do not match. Picture quality does not deteriorate.
Preroll (1030)	0~30 sec (0~30)	Sets preroll time. Any time from 0 to 30 seconds can be set (in 1-second units). (Initial Setting: 5 sec)
Still (1040)	1 (0) sec 3 (1) sec 30 (2) sec 1 (3) min 3 (4) min 5 (5) min	Select time taken until tape tension is automatically released to protect tape when VTR is left standing in stop or still-picture mode.
Stby Off (1050)	1 (0) sec 3 (1) sec 30 (2) sec 1 (3) min 3 (4) min 16 (5) min ∞ (6)	Selects READY OFF mode time. When selected time elapses, VTR is automatically transferred from tape tension release mode to READY OFF mode.
Drum Mode (1060)	Stop (0) Rotate (1)	Unconditionally establishes half loading status in READY OFF mode. Selects status of drum at this time. Stop: Cylinder stops rotating. Rotate: Cylinder keeps rotating.
Rec Ref (1070)	Input (0) Ref (1)	Input: Input video signal serves as reference signal. Ref: Signal supplied to REF IN connector serves as reference signal.
Out Ref (1071)	Auto (0) Input (1) Ref (2)	Can be selected only when "Input" has been selected for "Rec Ref". Auto: If REF IN signal is supplied, REF IN signal serves as reference signal; if not, video input signal serves as reference. If neither REF IN signal nor video input signal is supplied, internal sync signal serves as reference. Input: Input video signal serves as reference signal. Ref: Signal supplied to REF IN connector serves as reference signal.

■ The numbers in parentheses appear on the front panel display. Even when a TV monitor is not available, the setting statuses can easily be checked or changed.

■ The underlined mode in the Setting mode indicates the initial setting.



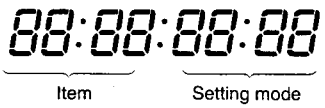
4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

—Home (cont.)—

Item	Setting mode	Description of function
In CF Det (1080)	Adj (0) Fix (1) Free (2)	Sets color frame detection mode for analog input video signals. Adj: Constantly monitors sync and burst phases, modulates sync position so that sync and burst phase relationship is made to comply with RS-170A, and then determines color frame. Fix: Detects color frame referenced to H sync and burst phases stipulated by RS-170A. Free: Does not detect sync and burst phase difference and artificially determines color frame internally.
Ref CF Det (1090)	Adj (0) Fix (1) Free (2)	Sets color frame detection mode of reference signal for video output. Adj: Fix: } Same as with "In CF Det". Free:
Cap Lock (1100)	Force (0) Auto (1)	Enables color framing lock mode to be selected when 4F (NTSC) or 4F/8F (PAL) has been selected in capstan lock mode. Force: Locks color frame at start of playback and thereafter operates in 2F mode. Auto: Servo is applied so that color frame is locked at all times.
Cue Set (1110)	Normal (0) Auto (1)	Selects automatic increment function when CUE point is to be set. Normal: Manual selection Auto: Automatic selection using CUE SET button.
Ejct Freeze (1120)	Off (0) On (1)	Selects the video output in the EJECT or STBY OFF mode when the TAPE/EE switch has been set to the TAPE position. Off: Mutes the video output. On: Freezes and output the playback picture on the screen at that moment.

■ The numbers in parentheses appear on the front panel display. Even when a TV monitor is not available, the setting statuses can easily be checked or changed.

■ The underlined mode in the Setting mode indicates the initial setting.



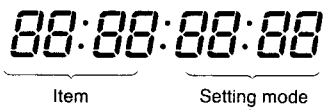
4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

—Video—

Item	Setting mode	Description of function
Lever Det (2010)	Peak (0) Sync (1)	Peak: Detects peak level of video signals using peak hold circuit. Sync: Detects level from pedestal to sync tip.
Sync (2020)	Off (0) On (1)	Turns sync signal ON/OFF for video signal output from VIDEO1 output connector. Off: Video signal is output without sync signal. On: Video signal is output with sync signal.
Burst (2030)	Off (0) On (1)	Turns burst ON/OFF for video signal output from VIDEO1 output connector. Off: Video signal is output without burst. On: Video signal is output with burst.
Level (2040)	Var (0) Unity (1)	Var: Activates settings of controls at bottom of front panel and video-related settings (video level, chroma level, set-up, hue and video phase). Unity: Cancels control settings listed above and fixes them to unity.
Rec CF (2050)	Force (0) Auto (1)	Selects lock mode for color framing recording. Force: Locks color framing when color framing was recorded in accordance with recording signal and color frame of recording signal has been stable for 5 seconds. Auto: Records color framing in accordance with recording signal at all times.
SCH Meter (2060)	Input (0) Ref (1)	Input: Indicates video signal SCH on SCH meter. Ref: Indicates reference signal SCH on SCH meter.
Control (2070)	Panel (0) External (1)	Switches control of video level adjustments. Panel: Control is exercised by front panel controls. External: Control is exercised from external controller. **(Note)** When this item is set to "Panel" with an external controller connected, communication may be interrupted.
Line Blank **No. 8 (2908)** **No. 9 (2909)** **No. 10 (2910)** **No. 11 (2911)** **No. 12 (2912)** **No. 13 (2913)** **No. 14 (2914)** **No. 15 (2915)** **No. 16 (2916)** **No. 17 (2917)** **No. 18 (2918)** **No. 19 (2919)** **No. 20 (2920)** **No. 21 (2921)** **No. 22 (2922)**	Off (0) On (1)	Enables blanking lines within vertical blanking period to be set in line units. NTSC: Lines 10 to 21 PAL: Lines 8 to 22

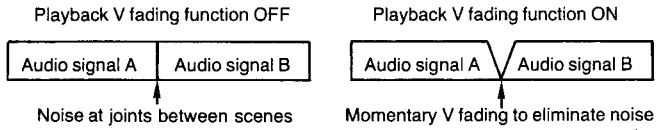
■ The numbers in parentheses appear on the front panel display. Even when a TV monitor is not available, the setting statuses can easily be checked or changed.

■ The underlined mode in the Setting mode indicates the initial setting.

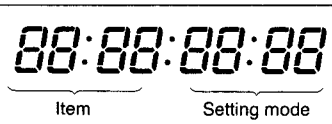


4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

—Audio—

Item	Setting mode	Description of function
PB Fade (3010)	Off (0) On (1)	Controls playback V fading. This function provides momentary V fading to eliminate the audio noise occurring during playback at joins between scenes to ensure smooth continuity of shots tapes with in-camera editing. Off: No playback V fading On: Playback V fading functions at all joins on tape to ensure smooth continuity of shots tapes with in-camera editing. •The in-camera edit shooting data is recorded automatically, it is sensed during playback and V fading provided. 
PB Out (3020)	Delayed (0) Instant (1)	Sets playback output characteristics. It takes a little time for audio signal to be output when mode transfers from stop to play. This time can be reduced. Delayed: Sound is output after the transfer is first completed. Instant: Time taken for sound to be output is reduced but initial part of sound is incomplete.
Emphasis (3030)	Off (0) On (1)	Sets pre-emphasis. If emphasis (boosting of high-range level) is applied when analog audio input signals are recorded on digital audio channel, the emphasis circuit which automatically attenuates only those components boosted during recording is activated during playback. Off: Normal recording mode. On: Emphasis and de-emphasis circuits are activated.
D Audio (3040)	Serial (0) AES/EBU (1)	Selects digital audio.
Ch. 1 (3041) **Ch. 2 (3042)** **Ch. 3 (3043)** **Ch. 4 (3044)**	Analog (0) Digital (1)	Setting is enabled when AUDIO INPUT switch has been set to USER SET. Setting selects digital or analog. •"Digital" refers to signal set with digital audio selection.
Rec Ch. (3050)	Off (0) On (1)	Selects recording channel. Off: None of the recording channels are selected. On: Selected channels are used for recording.
Ch. 1 (3051) **Ch. 2 (3052)** **Ch. 3 (3053)** **Ch. 4 (3054)**	Ch 1 (1) Ch 2 (2) Ch 3 (3) Ch 4 (4)	Enables signals which are supplied to digital audio channels to be recorded on any channel.

■ The numbers in parentheses appear on the front panel display. Even when a TV monitor is not available, the setting statuses can easily be checked or changed.



4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

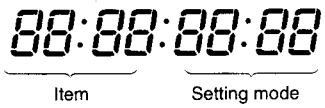
■ The underlined mode in the Setting mode indicates the initial setting.

—Audio (cont.)—

Item	Setting mode	Description of function
Cue Mix (3060)	D Mix (0) Line (1)	Selection of input signal which is to be recorded on analog cue channel Selects input signal which is to be recorded on analog cue channel. D Mix: Mixes and records signals which are supplied to digital audio channels. Line: Records signals which are supplied to CUE IN connector with normal gain.
D Mix Ch. 1 (3061) **Ch. 2 (3062)** **Ch. 3 (3063)** **Ch. 4 (3064)**	Off (0) On (1)	Selection of digital input signals to be mixed and recorded on analog cue channel Selects digital audio channel whose input signals are to be mixed and recorded simultaneously on cue channel. CUE D.MIX: D.MIX is selected when MIX channel is selected. Ch 1 / Ch 2 / Ch 3 / Ch 4 Off: Input signal is not mixed and recorded. On: Input signal is mixed and recorded.
Control (3070)	Panel (0) External (1)	Switches control of audio level adjustments. Panel: Control is exercised by front panel controls. External: Control is exercised from external controller. **(Note)** When this item is set to "Panel" with an external controller connected, communication may be interrupted.

■ The numbers in parentheses appear on the front panel display. Even when a TV monitor is not available, the setting statuses can easily be checked or changed.

■ The underlined mode in the Setting mode indicates the initial setting.



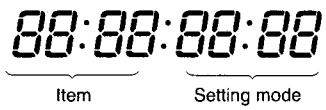
4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

—TC/CHR—

Item	Setting mode	Description of function
TC Slave INT (4010)	Auto (0) Preset (1)	Enables value of internal time code generator to be locked to time code value on tape read out by internal TCR (time code reader). Auto: Internal TCG value is locked to value read out by TCR. In this case, time code cannot be set. (Only when editing) Preset: Internal TCG value is not locked to value read out by TCR. In this case, time code can be set to any value.
EXT (4020)	Slave (0) Direct (1)	When SOURCE switch at bottom of front panel is set to EXT, settings below become valid. Slave: Time code data of external input is locked to internal TCG value and recorded. Direct: Time code data (time code and user bit) of external input is recorded unchanged.
UB Slave (4030)	Off (0) On (1)	When SOURCE switch at the bottom of front panel is set to INT, the value of internal time code generator can be locked to the value on tape which is read out by TCR (time code reader). Off: Internal TCG value is not locked to TCR readout value. On: Internal TCG value is locked to TCR readout value. When SOURCE switch is set to EXT, internal TCG value can be locked to the user bit of external input. Off: Internal TCG value is not locked to EXT UB. On: Internal TCG value is locked to EXT UB. **Notes:** • When the user bit is used with the slave lock, the contents of the user bit are recorded with a delay of 2 frames. • Set TC Slave INT/EXT to "Slave". The UB Slave setting is not valid at the "Direct" setting.
Run Mode (4040)	Free Run (0) Rec Run (1)	Selects how the time code is to be recorded after the START button is pressed. Free Run: Time code advances constantly regardless of recording. Rec Run: Time code advances only during recording.

■ The numbers in parentheses appear on the front panel display. Even when a TV monitor is not available, the setting statuses can easily be checked or changed.

■ The underlined mode in the Setting mode indicates the initial setting.



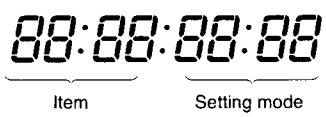
4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

—TC/CHR (cont.)—

Item	Setting mode	Description of function
VITC (4050)	Off (0) On (1)	Off: VITC with input video signal is recorded. On: Time code value generated by internal or external time code generator is recorded as VITC.
Pos. 1 (4051) **Pos. 2 (4052)**	No. 8 (8) No. 9 (9) No. 10 (10) No. 11 (11) No. 12 (12) No. 13 (13) No. 14 (14) No. 15 (15) No. 16 (16) No. 17 (17) No. 18 (18) No. 19 (19) No. 20 (20) No. 21 (21) No. 22 (22)	Sets lines in which VITC signal is to be inserted. The same signal cannot be selected for Pos. 1 and Pos. 2. NTSC: Lines 10 to 21 (Initial Setting: 14 and 16 lines) PAL: Lines 8 to 22 (Initial Setting: 11 and 13 lines)
UBG (4060)	Both (0) LUB (1) VUB (2)	When UBG has been preset from front panel or RS-422A, whether this preset UBG is to be set in LUBG or VUBG or both is selected. Both: Same value is set for both LUBG and VUBG. LUB: Value is set in LUBG only. VUB: Value is set in VUBG only.
Super (4070)	Off (0) TC (1) TC, ST (2) TC, ST, ER (3)	Selects whether signal from VIDEO OUT3 connector is to be superimposed on the monitor. Off: Superimposing is not displayed. TC: Time code is superimposed. TC, ST: Time code and VTR status are superimposed. TC, ST, ER: Time code, VTR status and error message are superimposed.
Pos. X (4071) **Pos. Y (4072)**	0~7 (0~7) 0~9 (0~9)	POS. X: Adjusts horizontal position 0 to 7. (Initial Setting: 0) POS. Y: Adjusts vertical position 0 to 9. (Initial Setting: 9)
CF Bit (4080)	Off (0) On (1)	Turns ON or OFF CF bit stipulated by SMPTE (NTSC) or EBU (PAL) standard during recording.
DF Mode (4090) **(NTSC only)**	Off (0) On (1)	Selects whether TCG value is to be counted up in drop frame mode or non-drop frame mode during TC recording.

■ The numbers in parentheses appear on the front panel display. Even when a TV monitor is not available, the setting statuses can easily be checked or changed.

■ The underlined mode in the Setting mode indicates the initial setting.



4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

—Panel—

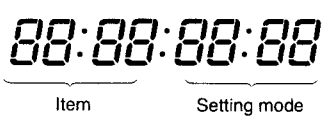
Item	Setting mode	Description of function
Alarm (5010)	Off (0) On (1)	Determines whether alarm is to sound when trouble has occurred. Off: Alarm tone is not heard. On: Alarm tone is heard.
Max Speed (5020)	16 (16) 32 (32) 60 (60) 100 (100)	Selects maximum shuttle (SHTL) speed. 100, 60, 32 or 16 times normal speed can be selected.

—I/F—

Item	Setting mode	Description of function
P-2 Mode (6010)	Off (0) Mode 1 (1) Mode 2 (2)	Selects control mode of RS-422A ports. Off: Turns RS-422A off. Mode 1: Commands from external control are accepted at IN port and rouled straight out through OUT port. (Use this setting in the remote mode.) Mode 2: In remote mode, commands are received at IN port and routed straight out through OUT port. Since data is not returned, it can be controlled by loop through. In local mode, commands are output from OUT port. Parallel running operation is enabled.
RS-232C (6020)	Off (0) On (1)	Selects whether control by RS-232C is to be accepted. Off: Not accepted. On: Accepted.
Baud Rate (6021)	300 (300) 600 (600) 1200 (1200) 2400 (2400) 4800 (4800) 9600 (9600)	Sets baud rate with RS-232C.
Data Len (6022)	8 (8) 7 (7)	Sets data length with RS-232C.
Stop Bit (6023)	1 (1) 2 (2)	Sets stop bit with RS-232C.
Parity (6024)	Odd (0) Even (1) None (2)	Sets parity with RS-232C.
Dev. ID (6030)	Default (0) ID 1 (1) ID 2 (2) ID 3 (3)	Enables device ID which is returned to controller on RS-422A to be selected. Besides its default value, there are 3 device IDs. Set the one corresponding to the controller being used. If control is not possible even when ID is changed, please consult with your dealer.

■ The numbers in parentheses appear on the front panel display. Even when a TV monitor is not available, the setting statuses can easily be checked or changed.

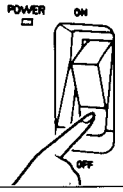
■ The underlined mode in the Setting mode indicates the initial setting.

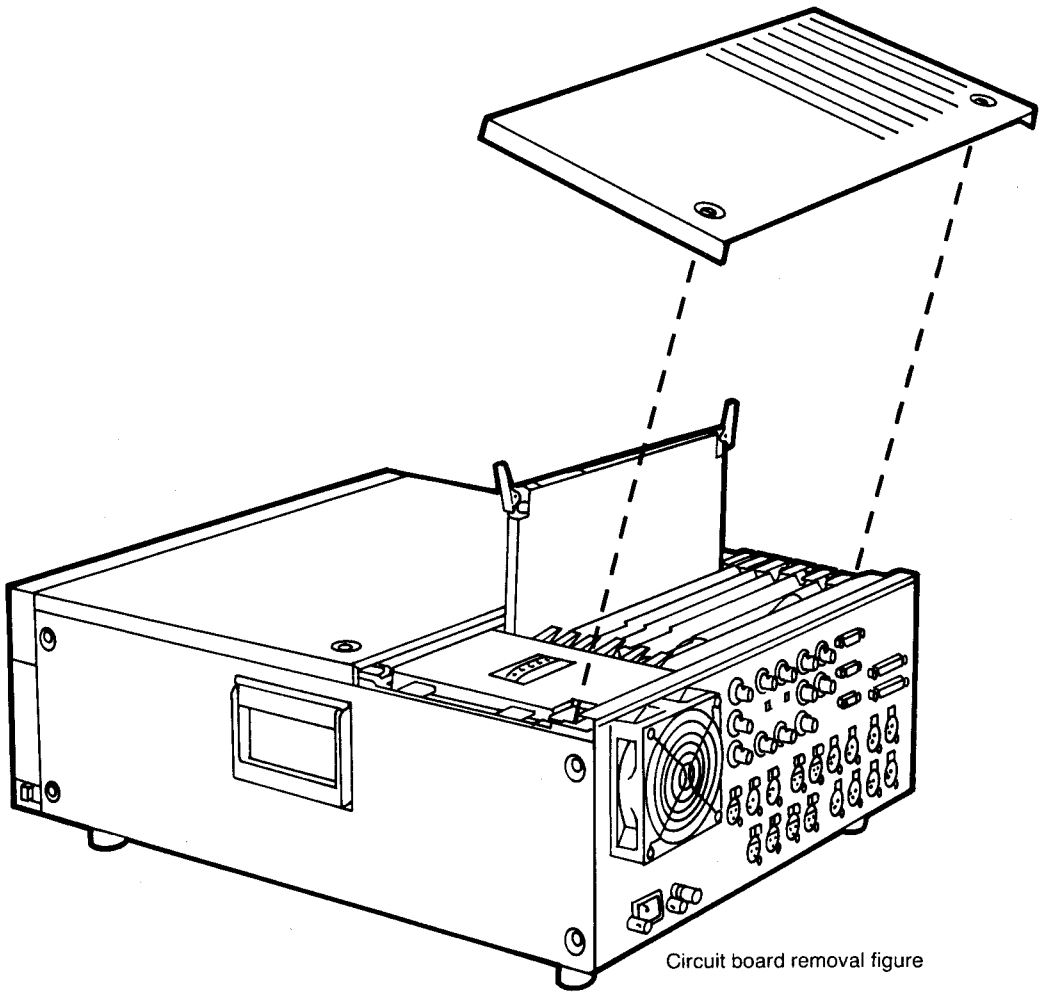


4 left digits: Indicate the setting item.
4 right digits: Indicate the setting mode.

Circuit board switches

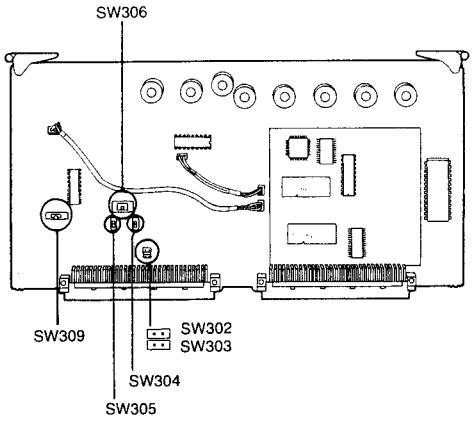
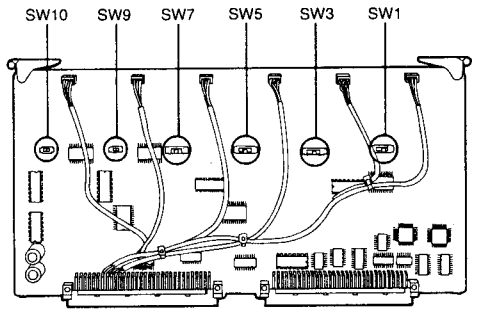
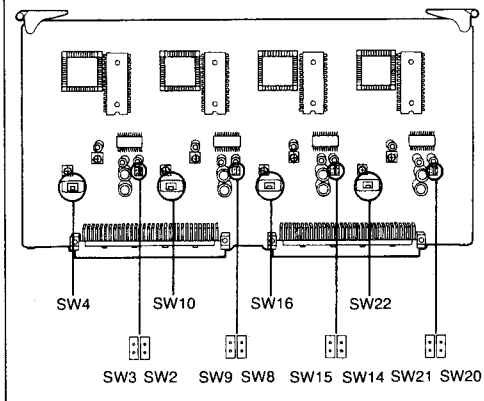
1 Set the power switch to the OFF position.





Circuit board removal figure

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, REFER CHANGE OF SWITCH SETTING INSIDE THE UNIT TO QUALIFIED SERVICE PERSONNEL.

Circuit board	Description
S3	 **SW302, SW303** These select the audio input impedance. | Switch Position | SW302 | SW303 | |---|---|---| | HIGH | Open | Shorted | | 600Ω | Shorted | Open | **SW304, SW305** These select MIC and LINE. MIC/LINE **(Note)** A −60 dBm(u) input is supplied if MIC is selected when SW306 is set to −20 dBm(u). **SW306** This selects audio input level. 4/0/−20 dBm (NTSC), 4/0/−20 dBu (PAL) **SW309** This selects the audio output level. 4/0/−20 dBm (NTSC), 4/0/−20 dBu (PAL)
S8	 **SW1 (CH1), SW3 (CH2), SW5 (CH3), SW7 (CH4)** Each of these selects the audio output level for the 4 channels. 4/0/−20 dBm (NTSC), 4/0/−20 dBu (PAL) **SW9 (L), SW10 (R)** These select the output level for audio monitoring. 4/0 dBm (NTSC), 4/0 dBu (PAL)
S9	 **SW4 (CH1), SW10 (CH2), SW16 (CH3), SW22 (CH4)** Each of these selects the audio input levels for the 4 channels. 4/0/−20 dBm (NTSC), 4/0/−20 dBu (PAL) **SW2, SW3, SW8, SW9, SW14, SW15, SW20, SW21** These select the audio input impedance for each channel. | Switch | CH1 | | CH2 | | CH3 | | CH4 | | | Position | SW2 | SW3 | SW8 | SW9 | SW14 | SW15 | SW20 | SW21 | | 600Ω | Shorted | | Shorted | | Shorted | | Shorted | | | HIGH | | Shorted | | Shorted | | Shorted | | Shorted |

When the SYSTEM, HUMID, SERVO and CF warning/indicator lamps light

SYSTEM

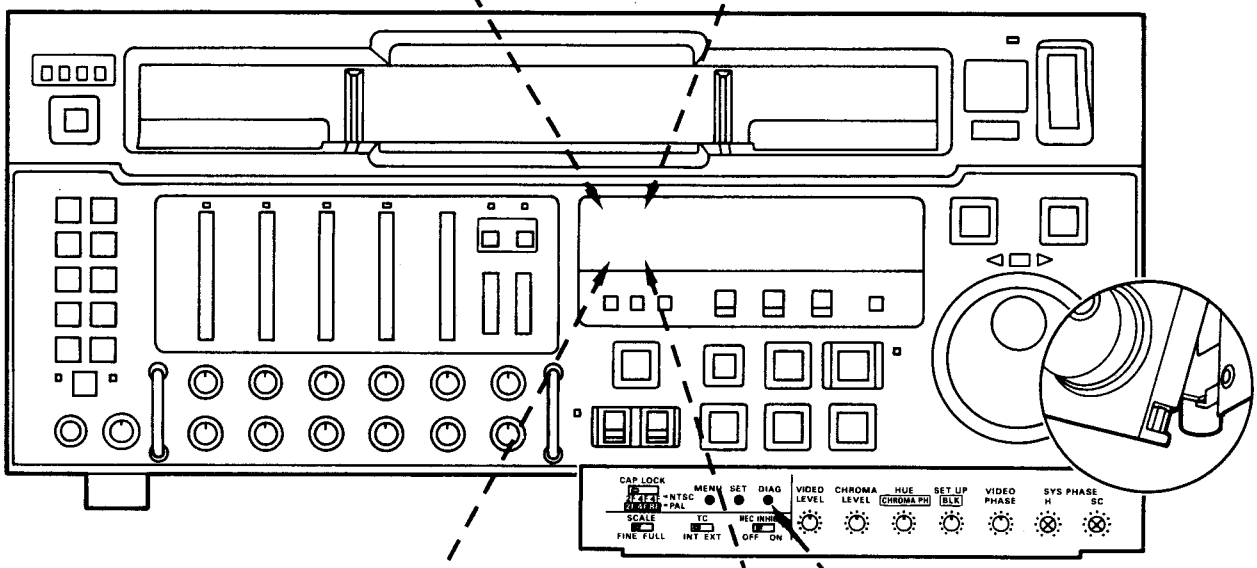
Trouble has occurred. The VTR's operation cannot be guaranteed.

- When the DIAG button is pressed, the nature of the trouble appears on the monitor screen. When the button is pressed again, the original screen is returned.

HUMID

Condensation has formed.

The cassette tape is automatically ejected. Keep the power on and wait until HUMID turns off.



DIAG button

RF

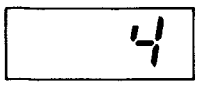
Trouble has occurred.

SERVO and CF (color framing)

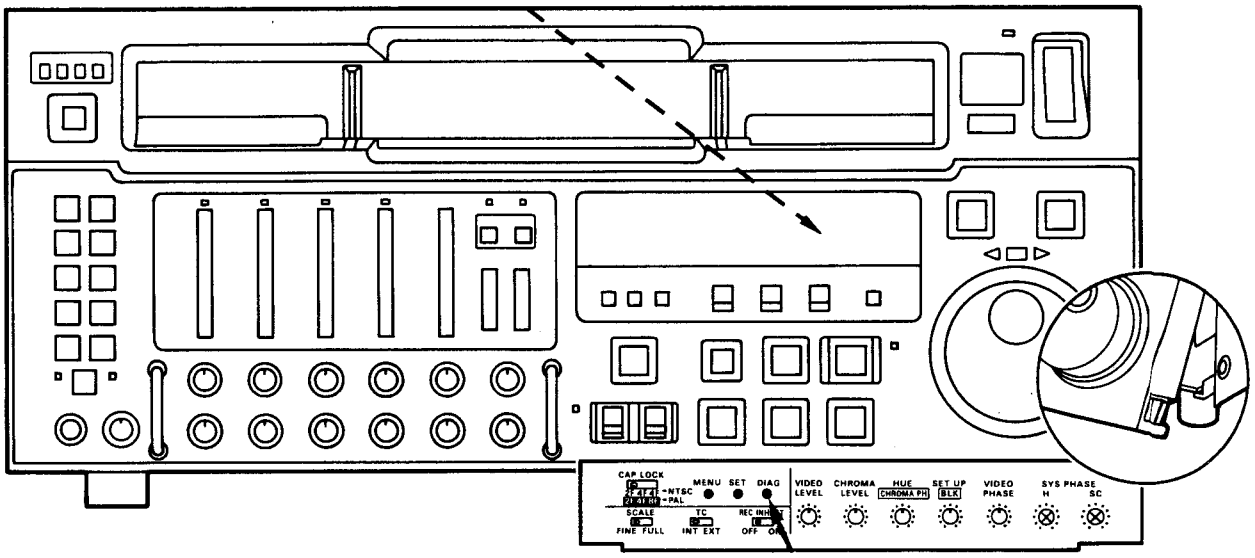
These do not light to indicate trouble. SERVO lights if the servo is stable and CF lights if there are no problems in the color framing adjustment.

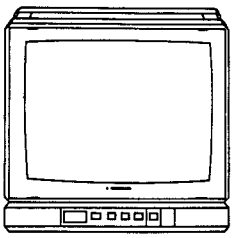
Error messages

If an error occurs, a number appears on the display to alert the VTR operator.



Check the error number and inspect. (See pages 68 to 72.)





The nature of the error appears on the monitor screen.

Press DIAG ● . The nature of the error appears on the screen.

Pressing the DIAG button again restores the original screen.

Error No.	Cause	Checkpoint
1	No digital video signals supplied.	•Are signals being supplied to SERIAL IN connector?
2	No sync signal from video signal processing.	——
3	Digital audio input signal is not locked to video input signal.	——
4	Audio PLL is not locked.	——
5	Monochrome input for analog video input signal.	•Are color signals being supplied to VIDEO IN connector?
6	No analog video signals supplied.	•Are color signals being supplied to VIDEO IN connector?
7	No signals supplied to REF VIDEO IN connector.	•Supply reference signal to REF VIDEO IN connector.
8	No burst in reference signal.	——
9	Abnormal reference signal SCH.	——
10	No external color frame input signal.	•Supply external reference signal to REF VIDEO IN connector.
11	Abnormal SCH when analog video input signals are supplied.	——
12	CRCC error has occurred in status of AES/EBU signal supplied to CH1/CH2.	•Check input signal.
13	CRCC error has occurred in status of AES/EBU signal supplied to CH3/CH4.	•Check input signal.
14	Parity error has occurred in AES/EBU signal supplied to CH1/CH2.	•Check input signal.
15	Parity error has occurred in AES/EBU signal supplied to CH3/CH4.	•Check input signal.
16	Sync error has occurred in AES/EBU signal supplied to CH1/CH2.	•Check input signal.
17	Sync error has occurred in AES/EBU signal supplied to CH3/CH4.	•Check input signal.

Error No.	Cause	Checkpoint
18	No erase current flowing to FULL ERASE, CUE, TC or CTL head; alternatively, TC head clogged.	——
19	Back-up data has been destroyed.	•Load factory file.
20	Undefined command has been received during RS-422A communication.	•Check receive command.
21	Sum check error has occurred in receive command during RS-422A communication.	•Check receive command.
22	Parity error has occurred in receive command during RS-422A communication.	•Check receive command.
23	Framing error has occurred in receive command during RS-422A communication.	•Check receive command.
24	Overrun error has occurred in receive command during RS-422A communication.	•Check receive command.
25	Time-out error has occurred during RS-422A communication.	•Check receive command.
26	Undefined command has been received during RS-232C communication.	•Check receive command.
27	Sum check error has occurred in receive command during RS-232C communication.	•Check receive command.
28	Parity error has occurred in receive command during RS-232C communication.	•Check receive command.
29	Framing error has occurred in receive command during RS-232C communication.	•Check receive command.
30	Overrun error has occurred in receive command during RS-232C communication.	•Check receive command.
31	Time-out error has occurred during RS-232C communication.	•Check receive command.

Error No.	Cause	Checkpoint
32	LTCR read-out range exceeded (interpolation display).	•Is tape being played back at over 60 times normal speed?
33	LTC not recorded on tape (interpolation display).	——
34	LTCR data error (interpolation display).	•Check heads and S3 circuit board.
35	No external time code supplied.	•Check connections of cables and connectors.
36	Data error in external time code.	•Check input signal.
37	Cooling fan has stopped.	•Suspend all further use of VTR until remedial action has been taken.
38	Cassette fails to move up even when 5 seconds have elapsed after operation transfer to cassette move-up.	•Motor stops operating.
39	Sub unloading operation is not completed within 10 sec.	•Motor stops operating.
40	Main unloading operation is not completed within 10 sec.	•Motor stops operating.
41	Start/end-of-tape detection LED obstruction or malfunction has been detected.	•In READY OFF mode motor stops operating and VTR is set to STOP mode.
42	Condensation has formed inside VTR.	•Cassette is ejected. Leave as is without turning off the power. The cylinder will rotate and dry out the condensation. Once the condensation has gone, the display turns off and normal operation can be resumed.
43	Cylinder rotation fails to reach rating or it exceeds rating for more than 5 seconds.	•Motor stops operating.
44	Trouble with capstan rotation has continued for more than 2 seconds.	•Motor stops operating.
44A	Trouble with reel rotation has occurred.	•Motor stops operating.

Error No.	Cause	Checkpoint
45	Trouble has occurred in tape tension and this has continued for more than 1 second.	•Motor stops operating.
46	Trouble with tape tension in shuttle (reel mode) has continued for more than 3 seconds.	•Motor stops operating.
46A	Trouble has occurred in rotational status of both reels in shuttle mode.	•Motor stops operating.
47	Rotation of take-up reel and supply reel in reverse direction continued for half a full turn.	•Motor stops operating.
48	Take-up reel has not rotated while the tape ran for 1.6″ (4 cm) in the capstan mode.	•Motor stops operating.
49	Trouble in communication between CPUs.	•Motor stops operating.
50	Supply reel motor has not operated.	•Motor stops operating.
51	Take-up reel motor has not operated.	•Motor stops operating.
52	A state in which system control is ignored and assigned speed is not reached has continued for more than 10 seconds.	•Motor stops operating.
52A	CTL head is clogged.	•Clean the head.
53	M circuit board has been unplugged.	•Plug in the circuit board properly.
54	S3 circuit board has been unplugged.	•Plug in the circuit board properly.
55	S4 circuit board has been unplugged.	•Plug in the circuit board properly.
56	S8 circuit board has been unplugged.	•Plug in the circuit board properly.

Error No.	Cause	Checkpoint
57	S10 circuit board has been unplugged.	•Plug in the circuit board properly.
58	Mechanism interface circuit board has been unplugged.	•Plug in the circuit board properly.
59	REMOTE JACK circuit board has been unplugged.	•Plug in the circuit board properly.
60	No communication response from front panel to system control.	•Inspect front panel cables, switches and panels.
61	No communication response from system control.	•Inspect front panel cables, switches and panels.
62	Cassette fails to move down when 4 seconds have elapsed after it was loaded.	•Cassette is ejected. Load it again.
63	Sub loading operation is not completed with 10 seconds.	•Cassette is ejected. Load it again.
64	Main loading operation is not completed with 10 seconds.	•Cassette is ejected. Load it again.
65	Reel base position does not match cassette size.	•Cassette is ejected. Load it again.

Connector signals

Digital

Video/Audio

Connector	Type
SERIAL IN	BNC×2 active through
SERIAL OUT1	BNC
SERIAL OUT2	
SERIAL OUT3	

Audio

Connector	Type
AUDIOI IN CH1/2	XLR 3P
AUDIO IN CH3/4	
AUDIO OUT CH1/2	
AUDIO OUT CH3/4	

Pin No.	Description
1	GND
2	HOT
3	COLD

Analog

Video

Connector	Type
VIDEO IN	BNC×2 loop through; with 75Ω termination switch
REF VIDEO IN	BNC×2 loop through; with 75Ω termination switch
VIDEO OUT1 (VB/VBS)	BNC×1, sync/burst ON/OFF selectable
VIDEO OUT2	BNC×1, with sync
VIDEO OUT3	BNC×1, for superimposing
WFM OUT	BNC×1, VIDEO IN/OUT, ENV CH0/CH1, EYE CH0/CH1, CTL, TC selectable
SC OUT	BNC×1

Audio

Connector	Type
AUDIO IN CH1	XLR 3P
AUDIO IN CH2	
AUDIO IN CH3	
AUDIO IN CH4	
AUDIO OUT CH1	
AUDIO OUT CH2	
AUDIO OUT CH3	
AUDIO OUT CH4	

Pin No.	Description
1	GND
2	HOT
3	COLD

Time code

Connector	Type
TIME CODE IN	XLR 3P
TIME CODE OUT	

Cue

Connector	Type
CUE IN	XLR 3P
CUE OUT	

Monitor

Connector	Type
MONITOR L	XLR 3P
MONITOR R	

Remote

V/A CONTROL 15-pin

Pin No.	Description	Pin No.	Description	Pin No.	Description
1	FRAME GND	6	—	11	—
2	—	7	REM RX (X) RECEIVE	12	—
3	—	8	REM TX (X) TRANSMIT	13	—
4	REM (G)	9	—	14	REM RX (Y) RECEIVE
5	—	10	—	15	REM TX (Y) TRANSMIT

REMOTE IN/ REMOTE OUT 9-pin

Pin No.	Description	Pin No.	Description	Pin No.	Description
1	FRAME GND	4	GND	7	REMOTE B IN COMMAND
2	REMOTE A IN COMMAND	5	—	8	REMOTE A OUT STATUS
3	REMOTE B OUT STATUS	6	GND	9	FRAME GND

RS-232C 25-pin

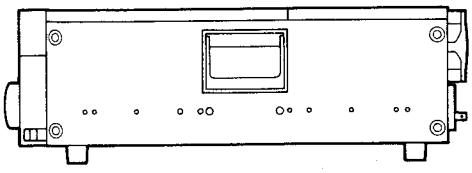
Pin No.	Description	Pin No.	Description	Pin No.	Description
1	FRAME GND	5	CTS Clear to send	9, 19	—
2	TX Transmit data	6	DSR Data set ready	20	DTR Data terminal ready
3	RX Receive data	7	GND Signal ground	21, 25	—
4	RTS Request to send	8	—		—

AUX
(PARALLEL I/O) 25-pin

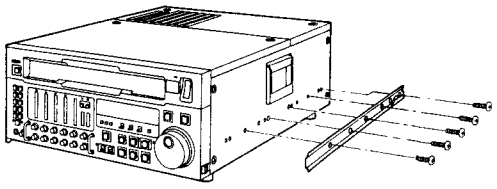
Pin No.	Description	Pin No.	Description	Pin No.	Description
1	PLAY COMMAND	10	——	19	STAND BY STATUS
2	STOP COMMAND	11	——	20	PREROLL STATUS
3	FF COMMAND	12	+15 V	21	SERVO LOCK STATUS
4	REW COMMAND	13	PLAY STATUS	22	——
5	REC COMMAND	14	STOP STATUS	23	——
6	EJECT COMMAND	15	FF STATUS	24	——
7	STAND BY COMMAND	16	REW STATUS	25	GND
8	PREROLL COMMAND	17	REC STATUS		
9	CUE SET COMMAND	18	EJECT STATUS		

Rack-mounting using AJ-MA34 adaptor (optional accessory)

1 Remove the screws on the left and right of the VTR.

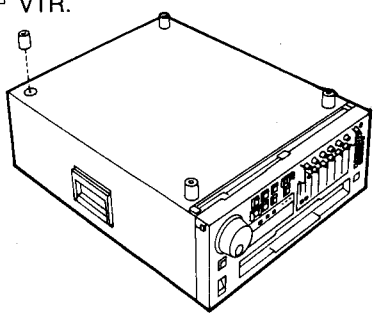


2 Attach the inner member of the slide rail using the screws removed in step 1.



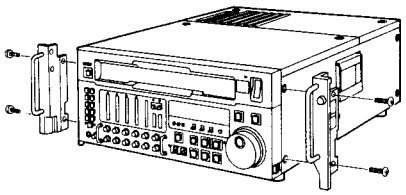
Inner member

3 Remove the feet on the bottom of the VTR.



4 Attach the outer member brackets to the rack.

5 Attach the AJ-MA34 rack-mounting adaptor.



6 Mount the VTR into the rack.

After having mounted the VTR, check that it can moved smoothly along the rail.

Recommended mounting rail: CHASSIS TRAK
Rail
Bracket

For further details, consult with your dealer.

Notes:

- Keep the temperature in the rack between 41°F to 104°F (5°C and 40°C).
- Bolt the rack securely to the floor so that it will not topple over when the VTR is pulled out.

MEMO

MEMO

Panasonic

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P E

Service Manual

Supplement
Service
Manual

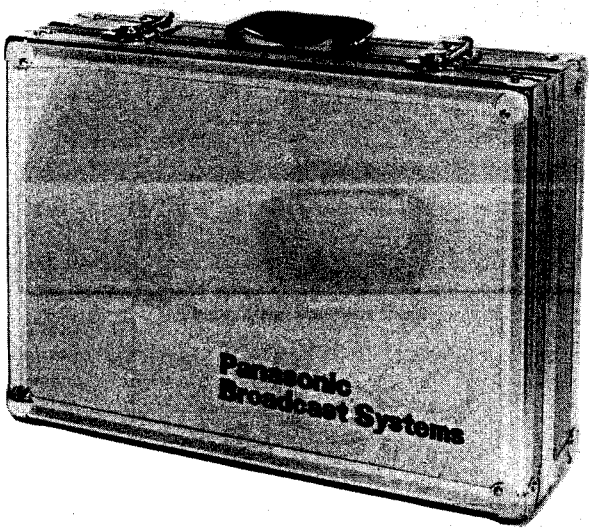
Panasonic
Broadcast Systems

Order No. VSD9201T001

Technical Information

Broadcast Product

SUBJECT D3 Tool Kit (Part No. VFK0813)

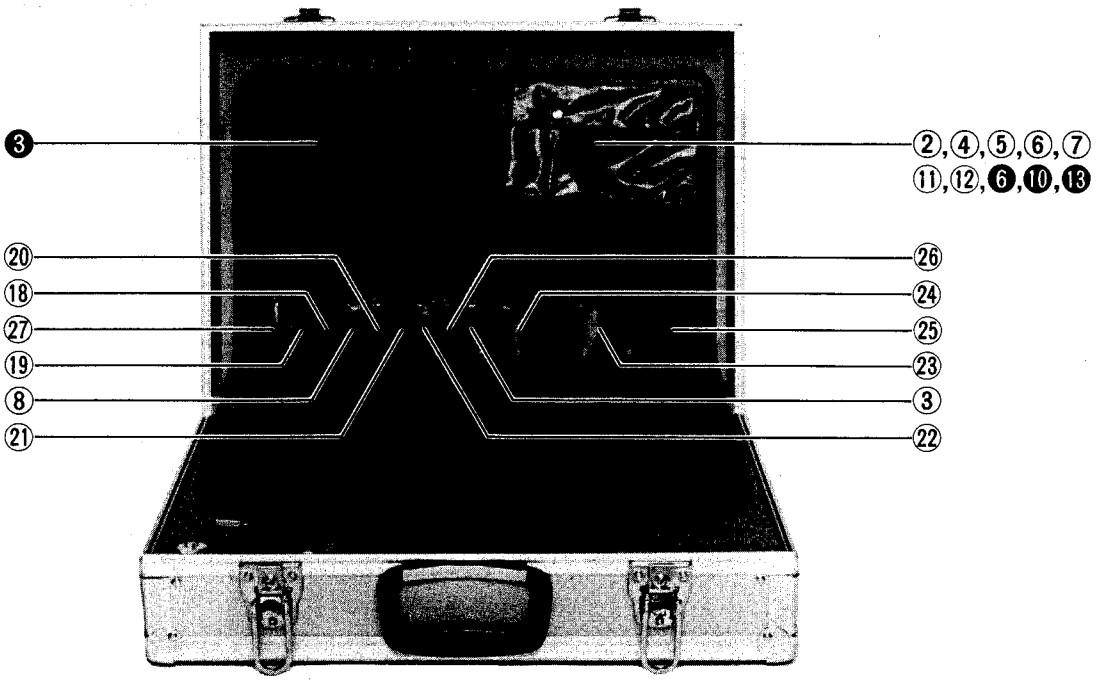


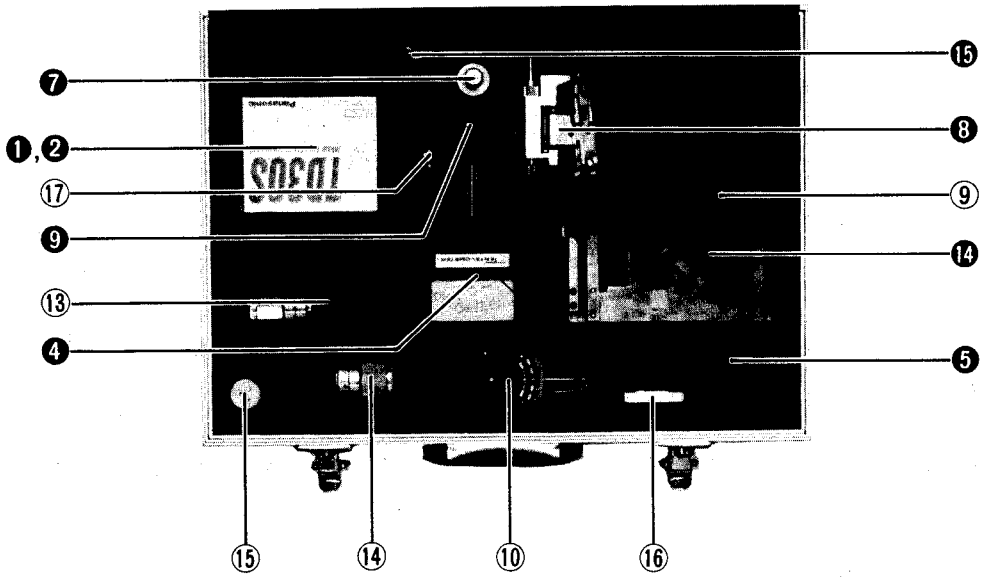
This D3 Tool Kit contains all the equipment required to perform proper alignment of D3 digital VTRs.

This Tool Kit was developed to be an effective aid to assist in performing mechanical adjustments efficiently.

This kit will satisfy those needs.

Panasonic

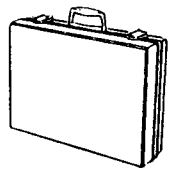
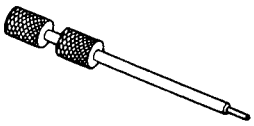
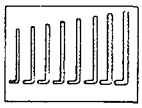
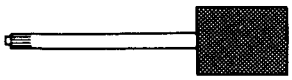
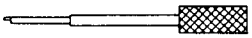
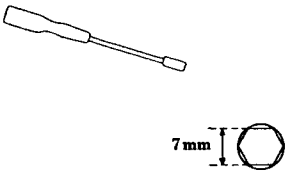
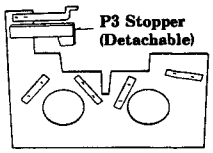
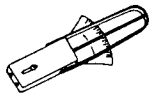
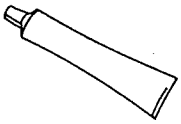
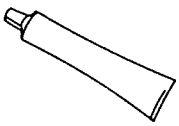
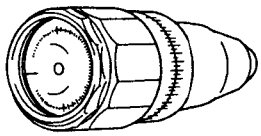
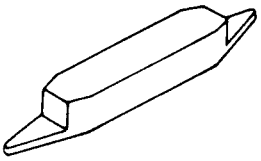
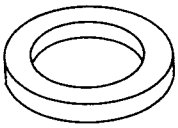
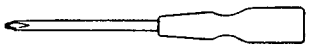
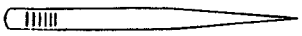
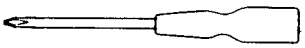
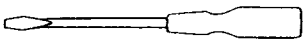
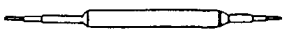
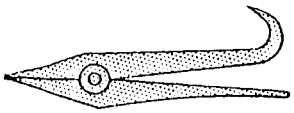
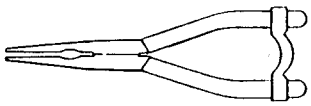
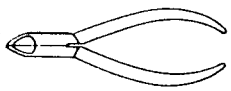
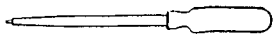
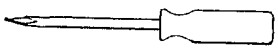




○ : STANDARD TOOLS

● : OPTIONAL TOOLS

Standard Servicing Fixture & Tools

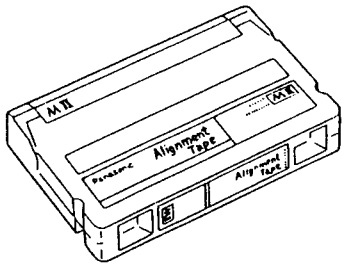
1 VFK0812 Tool Case 	2 VFK293 Post Driver 	3 VFK0343 (or purchase locally) Check Light 	4 VFK0326 (or purchase locally) Hex. Wrench Set  Gosho's Hex. keys No. 505-G 1.27, 1.5, 2.0, 2.5, 3.0
5 VFK0446 Fine Adjustment Screw Driver (3mmϕ) 	6 VFK0357 (ϕ1.5) 7 VFK0358 (ϕ2) Eccentric Screwdriver 	8 VFK0676 (or purchase locally) Nut Driver (7mm)  7mm	9 VFK0719 Mech. Neutral Adjustment Plate  P3 Stopper (Detachable)
10 VFK66 Fan Type Tension Gauge  (±2000 grams max.)	11 MOR265 Morlytone Grease (Black) (for metal part) 	12 VFK0749 Froiral Grease (White) (for plastic part) 	13 VGK71 (150g max.) 14 VFK0133 (1200g max.) Dial Torque Gauge 
15 VFK0134 Dial Torque Gauge Adaptor 	16 VFK0363 Post Height Fixture 	17 VFK0772 Reel Height Adj. Tool 	18 VFK0337 Philips Driver (Large) 
19 VFK0369 Tweezers 	20 VFK0366 Philips Driver (Small) 	21 VFK0367 Screw Driver 	22 VFK0368 Core Adjustment Driver 
23 VFK0335 Retaining Remover 	24 VFK0371 Radio Prier 	25 VFK0372 Cutter Prier 	26 VFK0338 Trimmer Adjustment Driver 
27 VFK0818 Screwdriver 			

CONTENTS OF D3 TOOL KIT

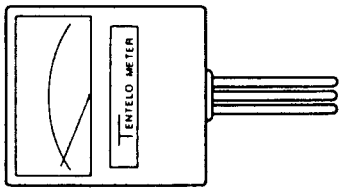
Ref. No.	Part No.	Q'ty	Tool Name	AJ-D350	AJ-D310
1	VFK0812	1	Tool Case		
2	VFK0293	1	Post Driver	V	V
3	VFK0343	1	Check Light	V	V
4	VFK0326	1	Hex Wrench Set	V	V
5	VFK0446	1	Fine Adjustment Screw Driver (3mmφ)	V	V
6	VFK0357	1	Eccentric Screwdriver (φ1.5)	V	V
7	VFK0358	1	Eccentric Screwdriver (φ2)	V	V
8	VFK0676	1	Nut Driver	V	V
9	VFK0719	1	Mech Neutral Adjustment Plate	V	
10	VFK66	1	Fan type Tension Gauge	V	V
11	MOR265	1	Morlytone Grease (Black)	V	V
12	VFK0749	1	Froiral Grease (White)	V	V
13	VFK71	1	Dial Torque Gauge (150g)	V	
14	VFK0133	1	Dial Torque Gauge (1200g)	V	V
15	VFK0134	1	Dial Torque Gauge Adaptor	V	V
16	VFK0363	1	Post Height Fixture	V	V
17	VFK0772	1	Reel Height Adjustment	V	
18	VFK0337	1	Philips Drive (Large)	V	V
19	VFK0369	1	Tweezers	V	V
20	VFK0366	1	Philips Driver (Small)	V	V
21	VFK0367	1	Screw Driver	V	V
22	VFK0368	1	Core Adjustment Driver	V	V
23	VFK0335	1	Retaining Remover	V	V
24	VFK0371	1	Radio Prier	V	V
25	VFK0372	1	Cutter Prier	V	V
26	VFK0338	1	Trimmer Adjustment Driver	V	V
27	VFK0818	1	Screwdriver	V	V

Optional Servicing Fixtures & Tools

1 VFM6180EC (PAL)
2 VFM6080EC (NTSC)
3 VFM6181EC (PAL)
VFM6081EC (NTSC)
VFM6186EC (PAL)
VFM6086EC (NTSC)
Alignment Tape

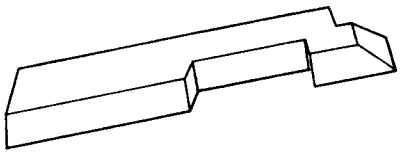


4 VFK0132
Back Tension Meter

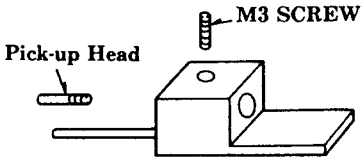


Tentelo Meter
Model: T2-H7-UM
(7 ounces, 200 grams)

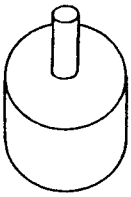
5 VFK0722
Inclined Post Angle Fixture



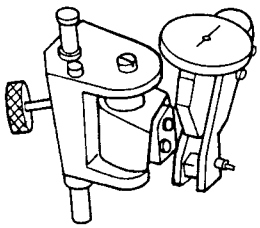
6 VFK0742
Micro Meter Pick-up Fixture



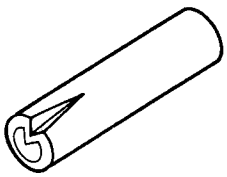
7 VFK0771
Calibration Block



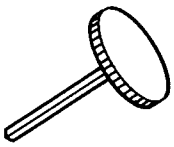
8 VFK0737A
Drum Replacement Tool



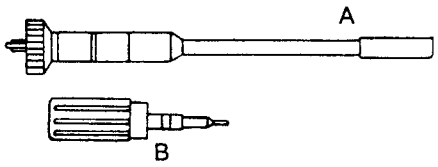
9 VFK0779
Position Change Driver



10 VFK0811
Hex Screw

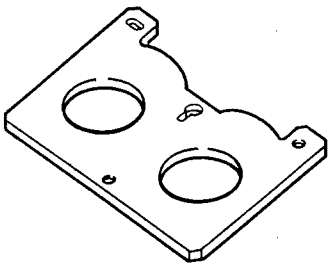


11 VFK0740
12 VFK0763
Torque Wrench A
Torque Wrench B

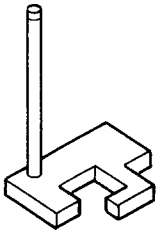


13 VFK0741
Adaptor
Screwdriver

14 VFK0761
D310 Mech Neutral Plate



15 VFK0760
D310 P2 Tension Post Gain
Adjustment Tool



OPTIONAL TOOL

Ref. No.	Part No.	Q'ty	Tool Name	AJ-D350	AJ-D310
❶	VFM6180EC (PAL) VFM6080EC (NTSC)	1	Alignment Tape (1)	V	V
❷	VFM6181EC (PAL) VFM6081EC (NTSC)	1	Alignment Tape (2)	V	V
❸	VFM6186EC-R (PAL) VFM6086EC-R (NTSC)	1	Alignment Tape (3)	V	V
❹	VFK0132	1	Tension Meter	V	V
❺	VFK0722	1	Inclined Post Angle Fixture	V	
❻	VFK0742	1	Micro Meter Pick-up Fixture	V	
❼	VFK0771	1	Calibration Block	V	
❽	VFK0737A	1	Center Drum Replacement Tool	V	
❾	VFK0779	1	Position Change Driver	V	
❿	VFK0811	1	Hex Screw	V	
⓫	VFK0740	1	Torque Wrench A	V	
⓬	VFK0763	1	Torque Wrench B	V	
⓭	VFK0741	1	Torque Wrench A adaptor	V	
⓮	VFK0761	1	D310 Mech Neutral Plate		V
⓯	VFK0760	1	D310 P2 Tension Post Gain Adjustment Tool		V

Technical
Descriptions

Panasonic
Broadcast Systems